TRANSACTIONS

AMERICAN ACADEMY
of
OPHTHALMOLOGY
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OTOLARYNGOLOGY

MAY - JUNE
1960

Volume 64 Number 3

ANNUAL MEETING, OCTOBER 9-14, 1960, CHICAGO

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American Academy of Ophthalmology and Otolaryngology

VOLUME 64 MAY - JUNE, 1960 NUMBER 3

TABLE OF CONTENTS

PAGE

CHRONIC LYMPHOEPITHELIAL SIALADENOPATHY WITH SIALODOCHIECTASIS 225
XV Wherry Memorial Lecture
JAMES H. MAXWELL, M.D.

ACOUSTIC EFFECTS OF MIDDLE EAR SUBSTITUTION 235
MERLE LAWRENCE, PH.D.

STAPES SURGERY: PATHOLOGIC INDICATIONS FOR BYPASS OPERATION AND VEIN GRAFT 248
INTRODUCTION
J. BROWN FARRIOR, M.D.

VESTIBULAR SUPPRESSION IN FIGURE SKATERS 264
BRIAN F. MCCABE, M.D.

HEARING TESTING ON THE VERY YOUNG CHILD
FOLLOW-UP REPORT ON TESTING THE HEARING OF 968 PRESCHOOL PATIENTS WITH THE PEDIACOUMETER 269
C. OLAF HAUG, M.D.
FREDERICK R. GUILFORD, M.D.

A QUASI-INTEGRATED BURIED MUSCLE CONE IMPLANT WITH GOOD MOTILITY AND ADVANTAGES FOR PROSTHETIC FITTING 272
EDWARD C. FERGUSON, III, M.D.
ALSON E. BRALEY, M.D.

(Continued on Next Page)

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TABLE OF CONTENTS *(Continued)*

PAGE

Experiences with Vitreous Preserved by Lyophilization 287
John Harry King, Jr., M.D.
John W. McTigue, M.D.
Shankar B. Chavan, M.D.

The Nature of the Antibacterial Effect of Human Vitreous 298
Kevin Hill, M.D.

Mycosis Fungoides with Intraocular Involvement 308
Helenor Campbell Foerster

NEW INSTRUMENTS

Combination Pillar and Palate Retractor 314
L. Reed Cranmer, M.D.

Ear Instruments for Office Use with Magnification 316
Donald A. Corgill, M.D.

A Simplified Self-Retaining Retractor for Middle Ear Surgery .. 317
Gordon H. Scott, M.D.

Extraction Loop for Small Lenses 318
Alston Callahan, M.D.

EDITORIALS

American Orthoptic Journal 319

In Memoriam — George M. Coates, M.D. ..... following 320

In Memoriam 321

Listing of Audiometers 323

Section on Instruction 324

News and Announcements XXXV

Positions Available XLV

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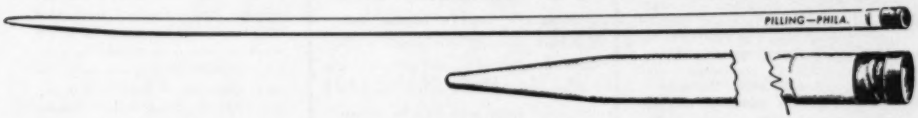

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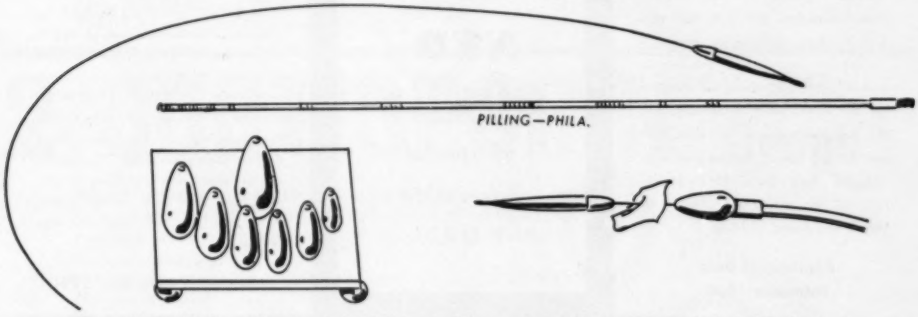

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Edited by **Dominick A. Barbara,** *Karen Horney Clinic, New York City.* Through the combined efforts of twenty-five well-known specialists this significant work became a reality — the FIRST AND ONLY COMPREHENSIVE BOOK on the subject. To insure a broad, eclectic viewpoint contributors were pooled from disciplines including *psychiatry, speech therapy, speech teaching, psychology, neurology,* and *social work.* The result is a sound, sensible volume on the psychological processes involved in the origin, comprehension, and treatment of speech, hearing, and communication disorders.

Publication Date April 1960

BABY TALK

By **Morris Val Jones,** *School for Cerebral Palsied Children, San Francisco.* When is baby talk serious? What are the causes? What can be done about it? An expert answers these basic questions. Parents are given **"common-sense" advice** about their role in helping their children overcome this speech problem and develop normal articulation. When parents come to you for professional help, save time by recommending this practical little book.

104 pp.; 9 il.; $4.50

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SPEECH THERAPY IN CEREBRAL PALSY

By **Merlin J. Mecham,** *Brigham Young University, Provo, Utah; and* **Martin J. Berko** *and* **Frances G. Berko,** *both of the Institute of Logopedics, Wichita, Kansas.* Covers the entire field of the brain injured child including the cerebral palsied, the aphasic, the feeble-minded, and the centrally deaf. Emphasis throughout the book is on aberrant behaviors which accompany congenital brain injury. Methods of diagnosis using the team approach are considered in detail. Therapy methods include physiotherapy, psychological readiness activities, and current methods of direct speech and hearing therapy. *(Amer. Lec. in Speech and Hearing)*

Publication Date May 1960

NEW OPPORTUNITIES FOR DEAF CHILDREN

By **Irene R. Ewing** *and* **Alex W. G. Ewing,** *both of the University of Manchester, England.* Describes the specific knowledge and skill that parents, teachers, audiologists, and medical officers must acquire if deaf children are to benefit from the effective use of hearing aids, lip-reading, and the new methods of education now possible for them. The authors have included their ORIGINAL TECHNIQUES for testing the hearing of babies and young children.

Publication Date February 1960

7

NEW BOOKS

of special interest to YOU!

CLEFT LIP AND PALATE REHABILITATION

By **William H. Olin,** *University Hospitals, State University of Iowa.* With a Chapter entitled *"The Oral Structures as a Speech Mechanism"* by **Duane C. Spriestersbach.** A wealth of information for anyone associated with the rehabilitation of patients with clefts. COMPLETE COVERAGE: Etiology, frequency, embryology, classification, surgical procedures, role of dentist, speech problems. Techniques are explained and case histories presented to show the various orthodontic and prosthetic treatment procedures.

Publication Date May 1960

ACOUSTICS IN SPEECH

By **Richard A. Hoops,** *Ball State Teachers College, Muncie, Indiana.* All who are interested in the role of sound in speech production and reception will welcome Mr. Hoops' long-needed, **practical** monograph. Various types of speech disorders are discussed — *pitch problems, hearing loss, and voice quality deviations.* Such terms as FREQUENCY, AMPLITUDE, WAVE MOTION, INTERFERENCE, VIBRATION, INTENSITY, and DECIBEL are made easy to understand by simplified, crystal-clear definitions.

Publication Date April 1960

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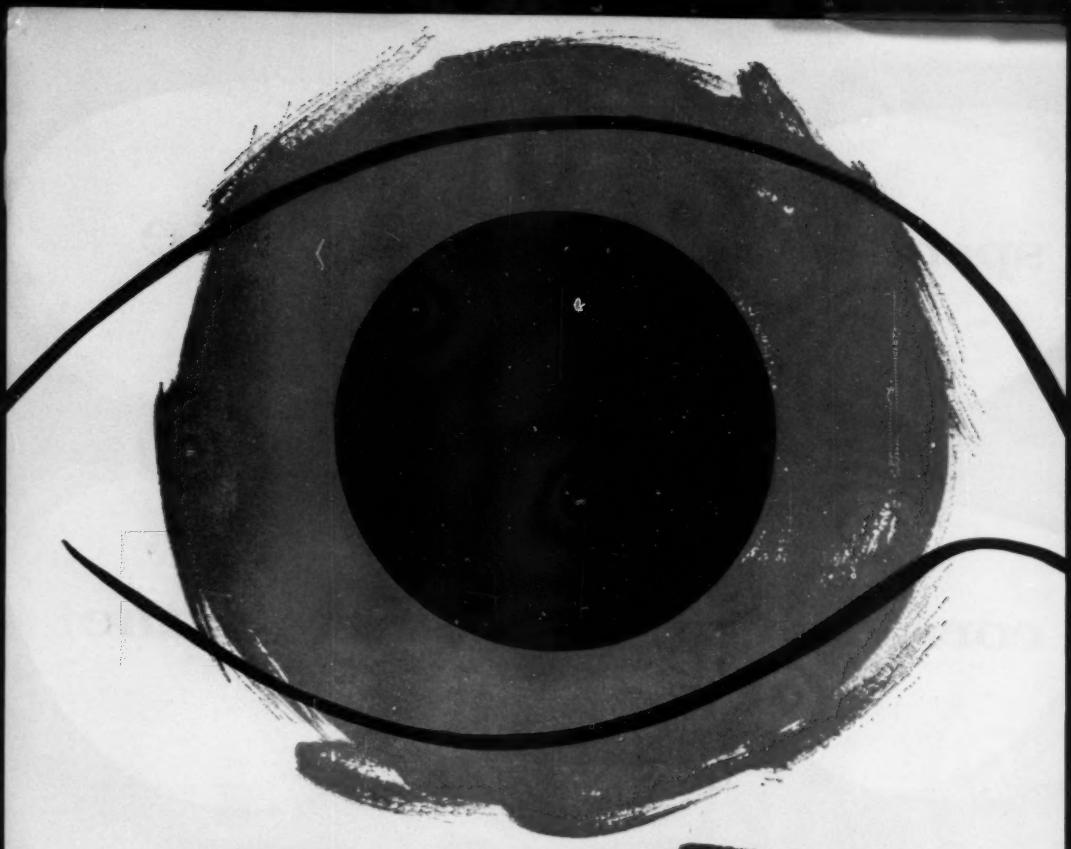

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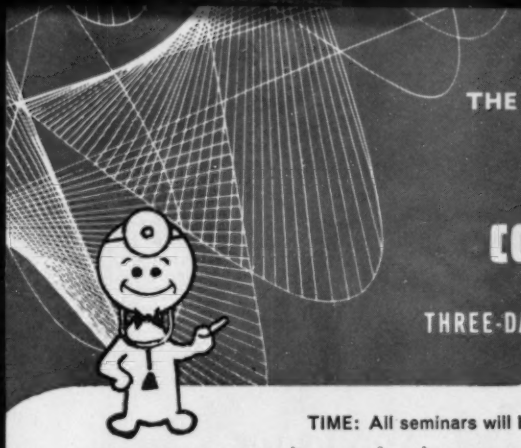

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March 1-2-3	March 4	Detroit, Michigan	Statler
March 8-9-10	March 11	Washington, D. C.	Statler
March 15-16-17	March 18	Salt Lake City, Utah	Utah
March 22-23-24	March 25	New York, New York	‡Vision Center
April 5-6-7	April 8	Los Angeles, California	Ambassador
April 12-13-14	April 15	Phoenix, Arizona	Westward Ho
April 19-20-21	April 22	Miami, Florida	McAllister
April 26-27-28	April 29	New Orleans, Louisiana	Jung
May 3-4-5	May 6	St. Louis, Missouri	Coronado
May 10-11-12	May 13	Dallas, Texas	Sheraton
May 24-25-26	May 27	Boston, Massachusetts	Sheraton-Plaza
June 7-8-9	June 10	Montreal, Quebec	Queen Elizabeth
June 14-15-16	June 17	Philadelphia, Pennsylvania	Sheraton
June 21-22-23	June 24	Denver, Colorado	Brown Palace

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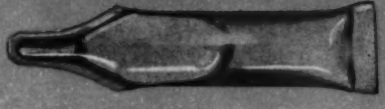

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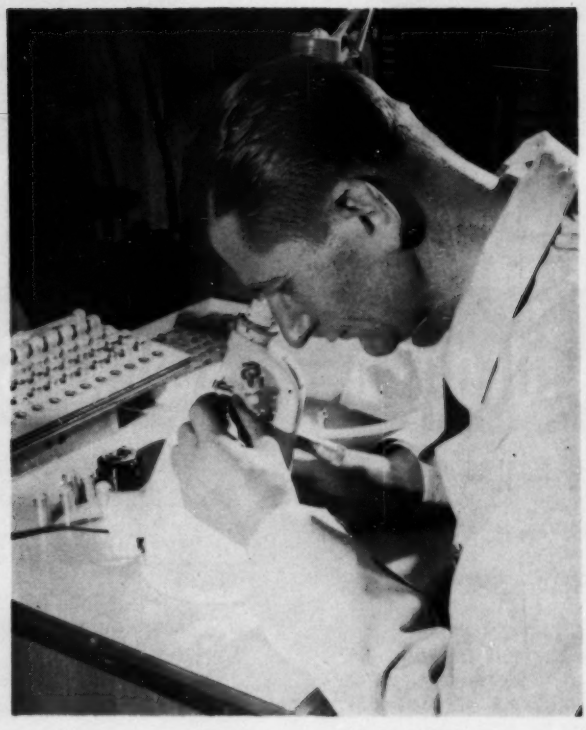

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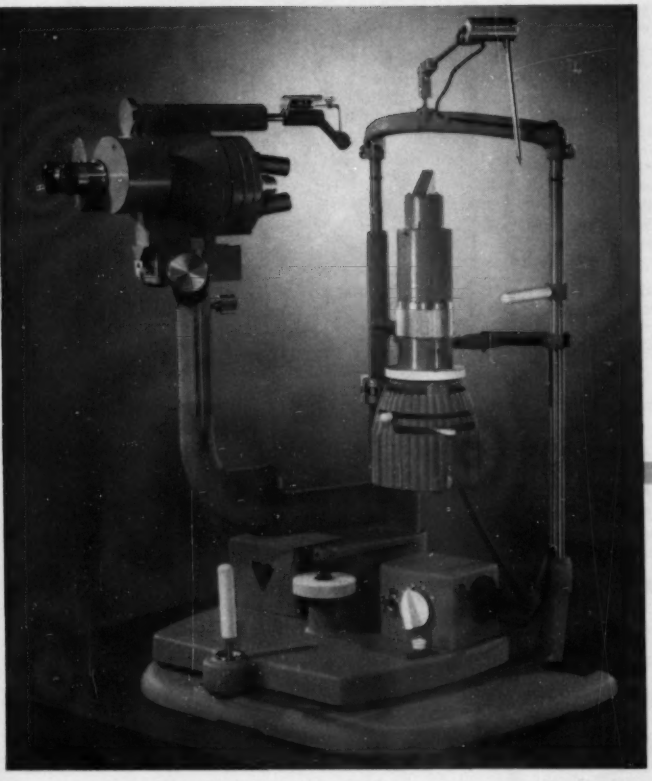

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WALL MOUNTED TREATMENT UNIT: Covered with stainless steel. Contains: air regulator with gauge, tubing, cut-off and air filter; nasopharyngoscope rheostat; push button; cautery transformer and rheostat; otoscope transformer and rheostat; transilluminator complete with rheostat, cord, handle lamps, antrum and frontal tips; seven metal drawers on fibre runners and one large drawer for towels; waste container; bakelite covered work table 21" x 12"; space for five spray bottles, twelve solution bottles, shelf for cotton jars; pocket for history and prescription cards; spray bottle heater. Presents an attractive appearance and will not tarnish and is easy to keep clean. Price complete without glassware $195.00. Without air but with electrical equipment $165.00. With air equipment only $150.00. Without either air or electrical equipment $115.00. Complete set glassware $46.50. Otoscope head, coiled cord and handle $29.50 complete.

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COMBINED SUCTION AND CUSPIDOR: Designed to eliminate the cost of installing a separate suction. The apparatus is 12" wide and projects 13¼" from the wall. The flushing rim and the suction is furnished with a vacuum breaker and should meet all plumbing requirements. Stop and trap not furnished. Available in ivory, green and white. Price $103.00.

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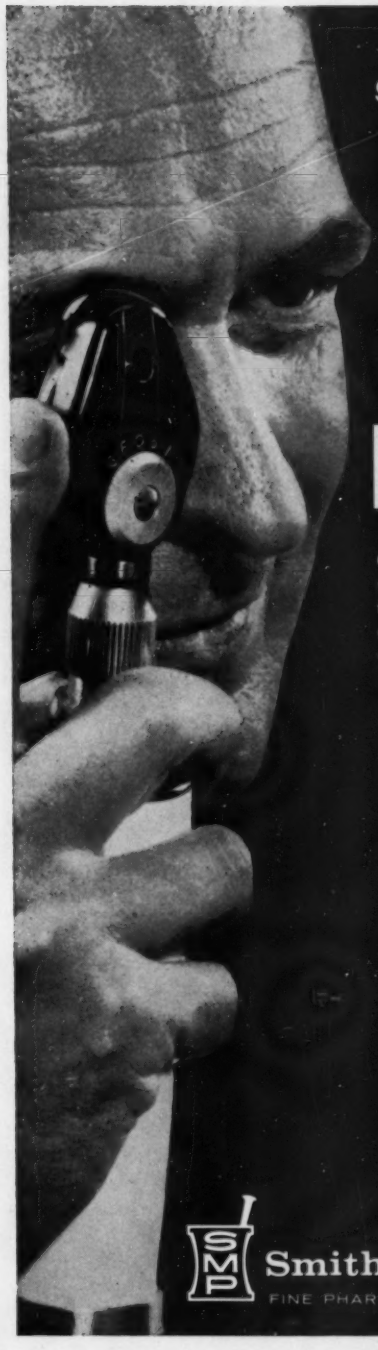

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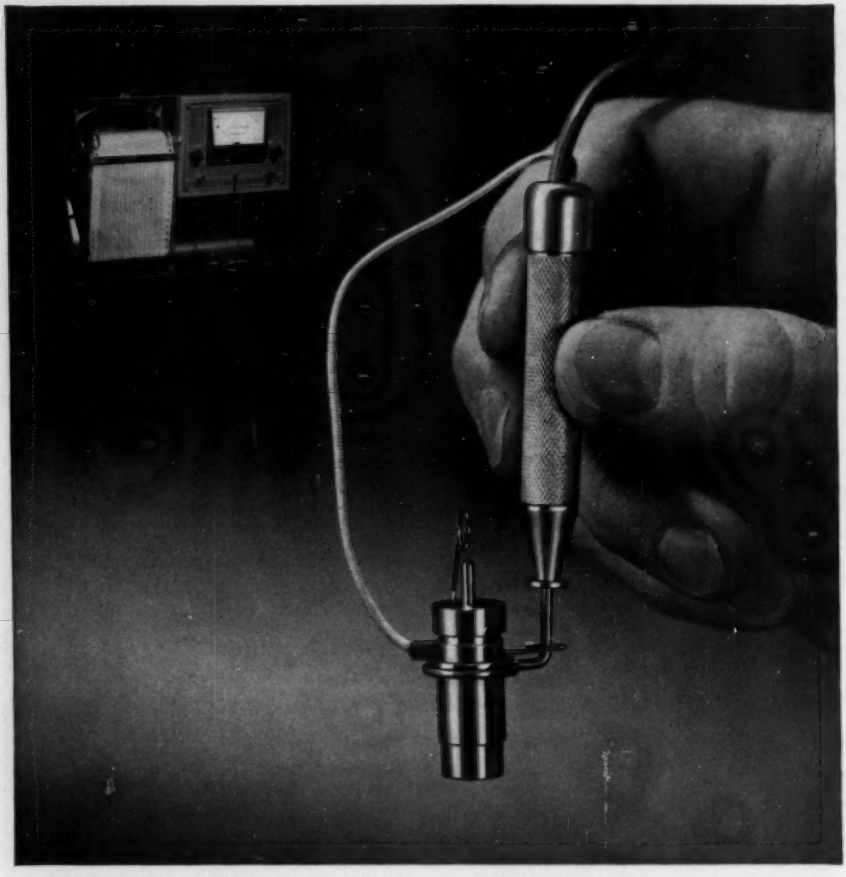

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1. *Am. J. Ophth.* 42:771, 1956.
2. *Am. J. Digest Dis.* 22:5, 1955.
3. *Med. Times* 84:741, 1956.

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(1) Gordon, D. M.: Am. J. Ophth. 47:536, 4/1959 • (2) Baker, W. B.: Aspects of Several Antibiotics, Drug & Cosmetic Industry, 12/1954

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1. Gordon, D. M.: Scientific Exhibit, American Medical Association, Annual Meeting, San Francisco, 1958.

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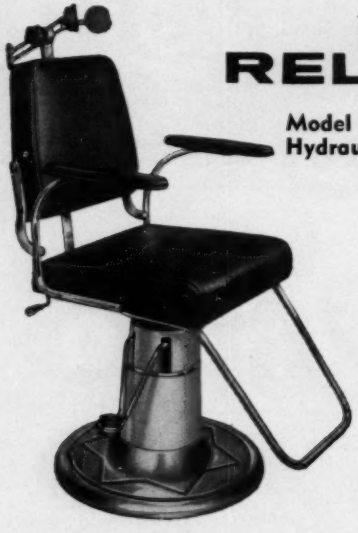

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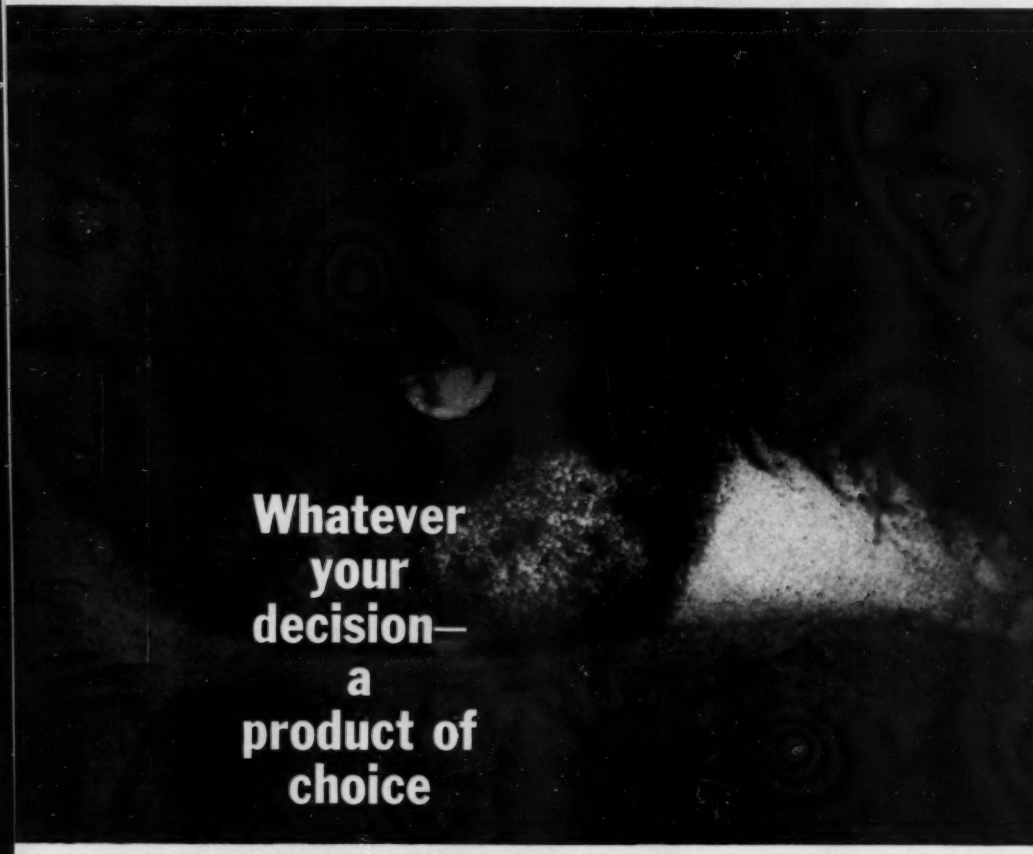

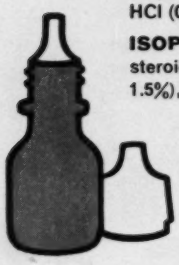

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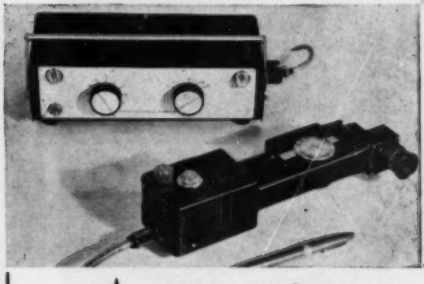

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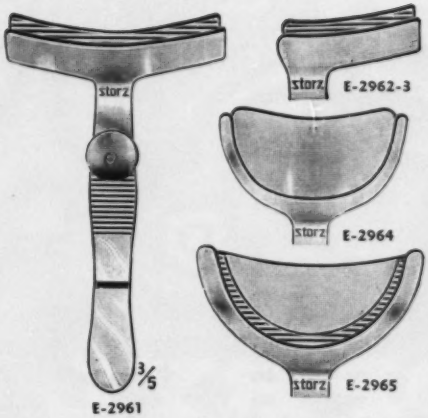

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XV Wherry Memorial Lecture

CHRONIC LYMPHOEPITHELIAL SIALADENOPATHY WITH SIALODOCHIECTASIS

JAMES H. MAXWELL, M.D.
ANN ARBOR, MICHIGAN

IT is with deep humility that I accept the honor bestowed upon me by this Academy. In commemorating the name of Dr. William P. Wherry we recall the driving force and tireless energy with which he served this Academy and Otolaryngology from 1920 until the time of his death in 1942. Although many of us did not have the privilege of knowing Dr. Wherry personally, we may enjoy the fruits of his labors at these Academy meetings, which still reflect his educational and organizational planning.

The title of this Memorial Lecture is Lymphoepithelial Sialadenopathy. My objective is an attempt to dispel some of the confusion that surrounds the terms *Mikulicz's disease* and *Mikulicz's syndrome*, and to report on research projects in the Department of Otolaryngology at the University of Michigan Medical Center.

In the year 1888, Johann von Mikulicz reported a case of chronic enlargement of the lacrimal and salivary glands at a meeting of the Society for Scientific Medicine at Konigsberg. In 1892 he published a detailed description of this patient along with a review of similar cases which he had been able to discover in a perusal of the available literature. This paper was entitled "Concerning a Peculiar Symmetrical Disease of the Lacrimal and Salivary Glands."[17] Mikulicz's patient was a 42-year-old, otherwise healthy, farmer whose lacrimal and salivary glands were palpable as firm, rather fixed, hard tumors. Even the sublingual and palatal glands were enlarged. There was no demonstrable abnormality of the internal organs, no lymph gland enlargement, and no leukocytosis. A copious secretion of saliva was noted during the examination. The enlargement of the lacrimal glands had been noted for seven months; the other painless swellings in the mouth and at the angles of the jaw appeared sometime later.

Since the patient's major complaint was swelling of the eyelids, portions of the lacrimal glands were removed. The relief was temporary, however, and recurrence of the tumors within two months prompted removal of both lacrimal glands and both submaxillary salivary glands.

Two months later the patient reported by letter that he "was very well and satisfied with his condition." The parotid swellings had increased but were not troublesome. Two weeks after this report, the patient suddenly fell ill with signs of peritonitis, and died nine days

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later. It was stated that the parotid swellings practically disappeared during his terminal illness.

Microscopic examination of the submaxillary glands revealed a massive small round cell infiltration of the interstitial connective tissue. Since groups of apparently unchanged acini were seen embedded in the mass of small round cells, it was concluded that the true parenchyma of the gland "played an entirely passive role."

Mikulicz was unable to define the pathogenesis of these tumors, stating that the histologic picture was not typical of a round cell sarcoma. The clinical behavior did not correspond to that of a "true sarcoma." Histologically, he felt that the condition was a tumor of lymphoid tissue and regarded it as belonging to the lymphosarcoma group; but apparently he finally concluded that the condition represented an "infectious or parasitic process in the broadest sense of the word."

In 1909, Campbell Howard[11] reviewed the published cases of Mikulicz's syndrome and divided them into three groups: Mikulicz's disease proper, pseudoleukemia, and leukemia. This classification was obviously inadequate, for the first group included various conditions of known specificity. Howard's theory that Mikulicz's disease proper could progress to a pseudoleukemia, and then to a leukemic phase, was obviously in error, but rather widely accepted for some time.

In 1907, Napp,[20] after reviewing the many case reports that followed Mikulicz's publication, expressed the opinion that the condition could be produced by many factors, including leukemia, pseudoleukemia, lymphomatosis, and tuberculosis. He reported one case due to tuberculosis.

In 1927, Shaffer and Jacobson,[27] reported ten cases of Mikulicz's syndrome seen in Johns Hopkins Hospital from 1910 to 1927. Four of these patients, three children and one adult, had lymphatic leukemia. One had lymphosarcoma, and one, a 12-year-old boy, had uveoparotid fever (Heerfordt's disease) but no biopsy specimen was taken. His symptoms subsided under radium and roentgen therapy. The remaining four patients were considered to have "Mikulicz's disease proper, as no definite etiologic agent could be discovered." However, three of these four had syphilis and in the other the reaction to the Wassermann test was positive. Pathologic material was obtained in only one of this latter group, but this patient died of pneumonia, syphilis, endocarditis, and aortic insufficiency. There was generalized lymphadenopathy and enlargement of the lacrimal and parotid glands. The lacrimal glands showed "several areas of infiltration with small round mononuclear cells." The parotid glands were not studied microscopically. Of the other three patients, one recovered after roentgen therapy and two could not be traced.

The author reclassified Mikulicz's syndrome into symptomatic and idiopathic groups as follows:

I. Mikulicz's disease
   A. Familial
   B. Mikulicz's disease proper

II. Mikulicz's syndrome
   A. Leukemia
   B. Tuberculosis
   C. Syphilis?
   D. Lymphosarcoma
   E. Toxic
      Lead, iodides, etc.
   F. Gout?
   G. Uveoparotid fever

This classification represents some improvement in that the conditions un-

der group II have been separated into specific lesions. However, the grouping still lacks homogeneity. Most importantly, the classification is not based entirely on histopathologic findings. The continued use of the terms *Mikulicz's disease* and *Mikulicz's syndrome* is confusing.

Sjögren[29] in 1933 described a condition characterized by keratoconjunctivitis sicca, dry mouth, parotid gland enlargement, and polyarthritis. Since then, many cases of this so-called Sjögren's syndrome associated with rheumatoid conditions have been recorded. It has been attributed by some to vitamin deficiencies and both vitamin A and riboflavin have been implicated. Others have felt that it was the result of endocrine dysfunction associated with the menopause; but still others have reported it in young females with no apparent menstrual disturbance. Lutman and Favata[14] stated that three cases which they had observed were all in slender nervous women with excitable temperaments.

Morgan and Castleman in 1953[19] made a study of the clinical and pathologic aspects of a group of eighteen cases considered to be Mikulicz's disease. They stressed the importance of histologic recognition of Mikulicz's disease and the separation of this group of cases from other conditions which could produce the so-called syndrome in order that proper therapy and prognosis could be offered. Differentiation from malignant lymphoma proved to be the most difficult problem because the lymphoid tissue was the predominant element in each instance. In reviewing their cases of malignant lymphoma of the salivary and lacrimal glands, they found that subsequent events justified the diagnosis of malignant disease in some instances, but in six individuals who were living and well nine to sixteen years after surgical removal of the tumor, the previous diagnosis was questioned. In each of these, a review of the histologic slides demonstrated an unusual change in the duct epithelium, which was investigated as a possible pathognomonic feature of Mikulicz's disease. They collected for study eighteen cases of this type from their own and neighboring laboratories. There was considerable variation in the pathologic diagnoses that had been made previously in this group of cases.

They concluded that the disease is of a benign chronic nature found predominantly in middle-aged females. The lacrimal glands are involved far less frequently than the salivary glands, of which one or more may be affected. Diffuse enlargement of the involved gland with preservation of normal lobular architecture is a distinguishing feature. The two histologic characteristics are (1) replacement of the acinar parenchyma by lymphoid tissue and (2) the production of epimyoepithelial islands as the result of the intraductal proliferation of epithelial and myoepithelial elements. The latter feature is considered by the authors to be diagnostic of Mikulicz's disease.

Because of the similarities between Mikulicz's disease and Sjögren's syndrome, the authors postulated that perhaps Mikulicz's disease is not a distinct clinical and pathologic entity but merely a localized manifestation of the more generalized complex described by Sjögren.

Morgan,[18] in 1954, investigated "The Probable Systemic Nature of Mikulicz's Disease and Its Relation to Sjögren's Syndrome." He had seen one of Sjögren's photomicrographs of the parotid gland which showed the identical changes which Morgan and Castleman had considered characteristic of Mikulicz's disease. Morgan reviewed Sjögren's original microscopic slides, the

clinical records of the eighteen cases of Mikulicz's disease that he had studied with Castleman, and other reported cases of Sjögren's syndrome. His review disclosed the following data:

1. Most of Sjögren's patients had the typical histologic picture of Mikulicz's disease.

2. In his previously recorded 18 patients with Mikulicz's disease, two had keratoconjunctivitis sicca, two had eye complaints not thoroughly studied, several had complained of dry mouth, and five had a history of arthritis. Thus, nine of the 18 patients had one or more features of Sjögren's syndrome.

Morgan concluded that the two conditions were related, if not the same disease. He also felt that presence or absence of lacrimal gland involvement should not be a basis for the separation of the two conditions. A biopsy of one lacrimal gland that was not enlarged clinically in a patient who had Sjögren's syndrome showed the characteristic changes of Mikulicz's disease.

Morgan felt that study of reported cases strongly suggested a systemic origin of Mikulicz's disease. He urged greater cooperation among the several services of a hospital to which patients with one or more of the findings of Sjögren's syndrome might be admitted.

Mikulicz, in his original paper, commented on the nature of the small cell infiltration which corresponded to the properties of a tumor of lymphoid tissue and stated that one could "think histologically of a lymphoma or lymphosarcoma." His next statement is indeed significant. "Herewith we resign ourselves to an unsafe ground, to a field in which clinical observation and histologic investigation are not yet brought fully into accord and in which the nomenclature is still inexact and ambiguous." How well this statement applies today!

The contributions of Sjögren and those of Morgan and Castleman have been significant advances in the efforts to determine the histopathologic characteristics and the pathogenesis of these lesions. Morgan's later contribution presents a most convincing argument that Mikulicz's disease and Sjögren's syndrome are related, if not the same disease.

A comprehensive review of the voluminous literature on chronic non-neoplastic enlargements of the major salivary glands done over the period of the last several years, and which will not be recited here, left me in a state of complete confusion regarding the classification of these lesions. I need only to mention the titles of a few papers describing benign parotid enlargements to emphasize this statement. As synonyms to the title "Benign Lymphoepithelial Lesion of the Parotid Gland," Godwin[9] used the terms *adenolymphoma, chronic inflammation, lymphoepithelioma, lymphocystic tumor,* and *Mikulicz's disease. Shellito* and *Stofer,*[28] in an article entitled "Lymphoepithelioma of the Parotid Gland," described a benign lesion. The title "Mikulicz's Syndrome in Chronic Leukemia" was used by Radding,[23] and the term *lymphoblastomatous Mikulicz's disease* has been used by several pathologists.

The members of the staff of the Department of Otolaryngology at the University of Michigan Medical Center have had the opportunity to observe many parotid gland tumors and inflammatory swellings over a period of years and have had the same frustrations in diagnosis and classification as have others interested in this field. Certain discrepancies made it obviously desirable to formulate a classification in which there was some semblance of correlation among the clinical, pathologic, radio-

graphic, and laboratory data. For example, cases of "recurring parotitis in children" and "recurring parotitis in adults," both of which have been described as clinical entities by many authors, were sometimes suppurative, as indicated by frank pus at the mouth of Stensen's duct, but many times were nonsuppurative, as indicated by the production of thick, gelatinous saliva or, in other instances, clear saliva which was sterile. Some of the recurrent suppurative lesions were associated with calculi and others not. The grouping of pathologically distinct benign and malignant lesions together under the heading "Mikulicz's syndrome" is undesirable. Likewise, there seems to be no reason except for the presence of lymphocytes to group cases of Warthin's tumor, or papilliferous lymphoid cystadenoma, with cases of diffuse lymphoid infiltration and ductal dilatation showing epimyoepithelial proliferation. There are many reports of benign hypertrophy and familial, and even endemic, hyperplasia, diagnoses which are not substantiated by sialography or histologic study. One further confusing point is the fact that I have seen in one instance a rather typical epimyoepithelial island, said by Morgan and Castleman to be pathognomonic of Mikulicz's disease and Sjögren's syndrome, in the parotid tissue of a patient who died of generalized lymphoblastomatosis. Finally, so far as I know, no one has defined exactly the disease which the patient of Mikulicz had. It was an interesting syndrome, the reporting of which certainly prompted an, as yet, unending controversy among pathologists, internists, allergists, pediatricians, and otolaryngologists.

Detailed studies of patients with various parotid tumors, infections, and asymptomatic enlargements have been undertaken at Michigan in an effort to formulate a more workable classification.

A classification of epithelial neoplasms was presented before this Academy in 1952.[15] It is not acceptable to many pathologists, but it has served us well in our efforts to correlate the clinical behavior of certain neoplasms with their histologic architecture, and thereby assist in determining the required extent of surgical removal.

After the standardization of a method of sialography[2] done under reasonably aseptic precautions and designed to show both the filling and emptying phase, this procedure was used on every patient with chronic or recurring swellings of the parotid glands seen at University Hospital. Histologic studies were done on biopsy specimens and various laboratory tests and clinical investigations performed as deemed indicated.

It was soon found that these patients could be divided into groups on the basis of some common denominators. In general, either the duct pattern was found to be normal, to have dilatation of the major ducts with postevacuation retention, or to show ectasia of the intralobular ducts in degrees varying from small punctate collections to massive excavations. It became clear that these two latter groups represented obstructive and nonobstructive sialadenitis, respectively. It was noted clinically that the glands in each instance were susceptible to secondary and probably ascending infection, but the obstructive types of sialadenopathy, whether due to stone or stricture, seemed more prone to chronic suppuration.

Nineteen adult patients, sixteen women and three men who had chronic or recurrent parotid enlargement with radiographic evidence of sialectasis, were studied in some detail.

In none of these was there enlargement of the lacrimal glands.

Of the sixteen females, ranging in age from 19 to 62 years but the majority being near the age of menopause, eight had rheumatoid arthritis, thirteen had keratoconjunctivitis sicca, and all complained of dry mouth, thus meeting the criteria for diagnosis of Sjögren's syndrome. The three males had only parotid enlargement.

All had lupus erythematosus cell tests which were negative. Ten biopsy specimens were removed, and all showed diffuse lymphoid infiltration, epimyoepithelial proliferation, and dilatation of the intralobular ducts.

The salivary secretion was smeared and cultured in nine instances. Five showed the presence of streptococcus viridans and four revealed no growth.

In eight cases of Sjögren's syndrome, thyroid salivary studies were done to show the salivary-blood serum protein bound iodine ratios. The results were inconclusive.

Seven patients with Sjögren's syndrome had follicle stimulating hormone and total estrogen determinations which showed nothing abnormal.

In support of the thesis that so-called Mikulicz's disease and Sjögren's syndrome are the same disease, it was interesting to note that in two patients there was only asymptomatic parotid swelling when the patients were first seen. Sialography, however, showed ectasia, and biopsy specimens demonstrated the typical changes of lymphoid infiltration, proliferation of ductal epithelium, and ectasia. Over a period of several years these patients have developed rheumatoid arthritis, dry mouth, and keratoconjunctivitis sicca. In one patient the disease was first diagnosed as a typical case of "recurrent parotid suppuration." She was shown by biopsy and sialography to have findings typically associated with Mikulicz's disease. Later she developed rheumatoid arthritis, then Raynaud's phenomenon, then chronic conjunctivitis, but no keratitis.

Of particular interest was the group of twelve chidren with chronic and recurring enlargements of the parotid glands with and without suppuration. Studies on this group are being continued and will be the subject of a future publication.[3] There are four males and eight females, ranging in age from four months to thirteen years. The youngest has had bilateral parotid enlargement since birth, chronic conjunctivitis, and radiographic evidence of a punctate type of sialectasis. No biopsy specimen has been taken.

Cultures were taken in seven of these 12 children. Four showed pneumococci, two grew a Streptococcus viridans, and one showed no growth.

A biopsy specimen was removed from one patient, aged 8 years. It demonstrated heavy lymphocytic infiltration and dilatation of intralobular ducts.

In four children, follicle stimulating hormone and total estrogen determinations were made but found to be within normal limits.

Suggestive of an endocrine imbalance was the finding that the parotid swelling decreased and the patients became asymptomatic at about the time of the menarche in two instances.

Recurrent sialadenitis in children has been considered a clinical entity and there are many excellent accounts of the condition, such as that by Pearson,[22] who stresses the allergic nature of the disease in a high percentage of cases. Plugs of eosinophiles have been described as being expressed from Stensen's duct.[10] In this present series of patients, there was no instance in which there was good clinical evidence that allergy played a major part.

Radiographically and histologically, these cases in children were indistinguishable from those in adults having Sjögren's syndrome.

Serum protein studies were done on fourteen women with Sjögren's syndrome and the three men with so-called Mikulicz's disease, as well as on three children with recurrent sialadenitis. It was noted that in the adults there was, in general, a reversal of the A/G ratio with the main globulin increase in the gamma globulins. This, of course, is found in rheumatoid arthritis, sarcoidosis and hyperimmune states. The serum proteins of the children did not show this change and the significance of this is not understood.

One of two patients demonstrating noncaseating epithelioid tubercles and thought to have Boeck's sarcoid, was subjected to sialography and removal of a biopsy specimen. Incidentally, he was the only patient in this series who demonstrated palpable enlargement of the lacrimal glands. The parotid enlargement was marked. The sialogram showed no sialectasis, and the photomicrograph of the biopsy specimen failed to demonstrate the existence of lymphocytic infiltration or ductal dilatation. The noncaseating epithlioid tubercles were clearly visible.

Persistent, usually asymptomatic, enlargement of the salivary glands due to nutritional insult is being recognized with increasing frequency. This condition, which appears to involve the parotid glands in particular, is associated with disturbed nutrition[8,12,25] as seen in obesity; diabetes mellitus with liver disease[7,24]; achalasia and anorexia nervosa[4]; alcoholism with or without cirrhosis,[6,30] as well as inadequate diet due to poverty or custom. Apparently the nutritional insult may be continuing or remote.

In this series of patients there were nine so classified. Two had diabetes mellitus with liver disease, five had dietary deficiencies with chronic alcoholism, one had anorexia nervosa, and one had achalasia. Sialograms were done in each instance and none of them demonstrated any sialectasis. Two patients who were subjected to biopsy and microscopic examination failed to reveal any significant lymphoid infiltration or characteristic proliferation of the ductal epithelium. These findings will be noted in the following slides. [Slide] This patient has achalasia, as is shown on the next slide. [Slide] The sialogram demonstrates rather normal arborization of the duct pattern. The histologic section demonstrates evidence of atrophy and intralobular fat deposit. The findings are somewhat similar to those in the patient reported by Nash and Morrison.[21] These latter authors cited the report of Kenaway,[13] who presented a well documented article concerning a group of patients in the Upper Nile Valley in Egypt who had parotid swellings and in whom incidence of nutritional deficiencies was very high.

With this study as a background, I would urge that a better classification of parotid gland enlargements be formulated. May I present for your appraisal an outline which may well be controversial and which certainly is incomplete in several respects. If it has any merit, it is on the basis of the effort that has been made to obtain some correlation among the clinical, radiographic, histopathologic, and laboratory data.

CHRONIC NON-NEOPLASTIC SIALADENOPATHY

I. *Obstructive*
   A. Calculi with or without secondary infection
   B. Strictures with or without secondary infection
   C. Inflammatory cysts

II. *Nonobstructive*

A. Chronic lymphoepithelial sialadenopathy with sialodochiectasis (with or without secondary infection)

B. Specific chronic infectious granulomas: tuberculosis actinomycosis, etc.

C. Nutritional deficiencies: alcoholism, diabetes, liver disease, etc.

D. Toxic
Iodine, thiouracil, etc.

E. Allergy

F. Noncaseating epithelioid tubercles (? Boeck's sarcoid)

G. Gout

Items E and F need further clarification. It is conceivable that some type of allergic or hyperimmune response may be involved in any case of lymphoepithelial sialadenopathy. Certainly there are authentic reports that eosinophilic plugs have been expressed from Stensen's ducts on occasion.

You will note the question mark before the term *Boeck's sarcoid* under F. The patients in this series with noncaseating epithelioid tubercles did not show signs of sarcoidosis as indicated by radiographic changes in the phalanges nor was there any pulmonary involvement.

You may have noted that gout seems to be listed more or less as an afterthought. Frankly, I do not know where to place it properly in the table. It may well be that chronic lymphoepithelial sialadenopathy can be associated with gout as well as with rheumatoid arthritis. In this series of patients there was one who had marked parotid enlargement and the sialogram showed marked excavation in both parotids. There were typical gouty tophi on the hands, and there were many uric acid crystals in the parotid saliva. The number and size of the uric acid crystals and the amount of amorphous urates in this patient's saliva made it seem quite possible that they produced obstruction of ducts throughout the gland. Apparently parotid involvement in cases of gout is quite rare, for this patient is the only one seen in the Arthritis Unit of University Hospital in the past several years.

Our continuing effort to determine the pathogenesis of lymphoepithelial sialadenopathy has led us into various basic research problems which, to date, have not given information leading to worthwhile preventive or therapeutic suggestions.

1. A study of the protein fractions in normal and abnormal saliva has been undertaken, using a technique of paper electrophoresis that has been standardized by Drs. Block and Blatt[5] in the Kresge Research Institute. Saliva is concentrated by dialyzing against 25 per cent PVP (polyvinyl pyrrolidone). Electrophoresis is accomplished in a Spinco Model R. Durrum type electrophoresis cell at a pH of 8.6 and ionic strength of 0.075 (buffer).

2. A study of the endings of sympathetic and parasympathetic nerves around the secreting acini of the major salivary glands is being conducted by Drs. Scharenberg and Blatt[26] in the laboratory of the Neuropathology Department. Their technique is one of silver staining which Dr. Scharenberg has perfected.

3. Stimulated by the work of Dr. William Beierwaltes[1] of the Department of Internal Medicine, who is investigating the autoimmune concept of chronic thyroiditis, Dr. B. F. McCabe and I[16] have been investigating the possibilities of an autoimmune basis for lymphoepithelial sialadenopathy. There are certain similarities in the background of

both diseases which suggest the possible presence of tissue auto-antigens. In each there is a rather characteristic hyperglobulinemia, and this increased globulin fraction may be high enough to reverse the A/G ratio in each disease. Further suggestive of an immune reaction is the fact that the increase in globulin is almost entirely by virtue of increase in the gamma globulin fraction. In this study so far, an antigen has been prepared from the normal cat parotid and emulsified with Freund's adjuvant. Immunization was done by injecting a series of cats intradermally between the shoulder blades. Biopsy specimens of parotid glands were taken after successive injections. Some suggestive lymphoid aggregates have been found in postimmunization biopsy. The significance of this is not known, for there has not been an increasing lymphocytic infiltration proportionate to the number of immunizing injections. Also, a few very small aggregates of lymphoid tissue were found in one of the four control cats. This would not be particularly discouraging were it not for the fact that there was a negative antibody titer to cat parotid antigen in the blood sera of the four injected cats. However, in those cats which showed lymphoid aggregates, hyperglobulinemia was found on electrophoresis of blood serum. This was not present in the other cats.

At present, we are also investigating the possible presence of auto-antibodies to human parotid antigen in individuals who have the diagnosis of chronic lymphoepithelial sialadenopathy with sialectasis. So far the findings are inconclusive but not totally discouraging.

Investigation of the physiology and pathologic physiology of the major salivary glands is a long-term undertaking. Information regarding the diseases under discussion is most inadequate and demands much further study. I would join Morgan in urging you to try to gain cooperation of the various hospital services in investigating patients with such diseases as lupus erythematosus, keratoconjunctivitis, dry mouth, gout, and rheumatoid arthritis to determine whether there is involvement of the salivary glands. There is no doubt that opportunities for study of these conditions are being missed.

CONCLUSIONS

Accumulated evidence indicates rather conclusively that Mikulicz's disease and Sjögren's syndrome are the same localized manifestations of a general systemic disorder. Occurrence of the condition may be in children or adults and may or may not show signs of secondary ascending infection. This group of cases classified as chronic lymphoepithelial sialadenopathy with sialectasis can be separated from other specific nonobstructive lesions by sialography and histopathologic examination of biopsy specimens. The precise pathogenesis of the subject lesions is unknown, but there is much evidence that endocrine imbalance plays an important role. The possibility of a hyperimmune response to tissue auto-antigens presents a challenging research problem which deserves further investigation.

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ACOUSTIC EFFECTS OF MIDDLE EAR SUBSTITUTION

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THE normal ossicular chain is a finely balanced structure suspended and supported by ligaments and muscle tendons, and it takes a very small amount of energy to vibrate this structure effectively. Today, in the presence of certain pathologic conditions, this fine anatomic arrangement of the middle ear is being altered in drastic ways. As long as certain acoustic principles are satisfied without producing severe medical problems, threshold sensitivity in many instances is brought to within 30 decibels of normal. However, in the minds of many otologists there are certain reservations about the universality of such results and many questions have been raised concerning the acoustic effects of particular phases of the various procedures.

Many of the answers to these questions can come only from animal experiments, since the disease process or the lack of normal sensitivity in the operated human ear makes accurate assessment unreliable. We have been investigating some of the problems arising from the surgical manipulation of the middle ear and a few of the clinically applicable results are reported here. Specifically, two questions have been raised and are the subjects of this report.

From the Physiological Acoustics Laboratory, Department of Otolaryngology, School of Medicine, University of Michigan. This investigation was supported in part by the Research and Development Division, Office of The Surgeon General, Department of the Army, under Contract No. DA-49-007-MD-634, and by the State appropriation to the University of Michigan for Research and Service in Utilization of Human Resources under project "Causes of Deafness."

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a. What is the possibility of introducing auditory abnormalities through elimination of the middle ear by removal of the ossicles and the attached muscles?

b. What is the effect of the angle of force acting upon the oval window and the effect of mass upon a substitute transmission system?

METHOD

The general procedure in the following experiments employed the recording of cochlear potentials in the presence of various middle ear alterations. These potentials reflect the effectiveness of vibration upon the sensory cells and so serve as an index to the ease of transmission of vibrations in all processes conducting sound to the inner ear.

The sound stimulus was provided by a speaker unit mounted outside a soundproof, shielded room. A hard-rubber tube conducted the sound from the speaker to a tube inserted in the animal's ear, thus providing a closed acoustic system. Determination of the sound pressure was carried out by means of a calibrated W. E. 640 AA condenser microphone-probe-tube combination, with the latter entering through the side of the sound-conducting ear cannula and terminating concentrically with it.

The cochlear potentials were recorded by means of a platinum-foil electrode placed on the round window membrane and an indifferent electrode in the temporalis muscle. These responses were amplified 1000 times by a Tektronix type 122 amplifier and read with a General Radio type 736-A wave analyzer.

The wave analyzer acts as a selective voltmeter tunable to any frequency from 0 to 16,000 cps with a band width of six cycles. It achieves this selectivity by combining the output of a variable-frequency oscillator with the incoming signal so that the sum of the two is always at 50,000 cps. This signal is passed through crystal filters, rectified and metered. By picking up the 50-kilocycle signal immediately after the filter, it is possible to utilize practically the entire 60 db range of the early analyzer stages together with the filtering properties of the crystals, which remove nerve potentials and general physiologic noise.

This system of recording has the advantage of providing a filtered signal for cathode-ray viewing if desired. It also makes a quiet signal of the frequency under study available for automatic recording. Because point-by-point plotting of response against sound level means stimulating the animal's ear over and over again, automatic recording with a gradually increasing signal is desirable. To provide for such recording we have used a Moseley model 2-A X-Y recorder. The X axis of this recorder is driven by the stimulating sound, which is swept in amplitude at any desired rate by a variable-speed motor-driven attenuator. The Y axis of the recorder picks up from the wave analyzer the 50-kilocycle signal, which varies in accordance with the magnitude of the response from the animal.

Thus several methods of recording are made available, making possible more exact interpretation of the cochlear response.

RESULTS

Effects of Cutting Tympanic Muscles and Eliminating Ossicular Chain

It has often been reported in the past that the majority of patients suffering from facial palsy and a consequent paralysis of the stapedius muscle experience what is commonly called "hyperacusis." There has been some debate over this term, because literally it means an abnormally acute sense of hearing, but, by general use, it has come to mean an abnormal feeling of discomfort produced by sounds above threshold intensity.

There has been much discussion about the cause of this "hyperacusis" in facial palsy, resulting in two points of view: one accounts for this intolerance of loud sounds on the basis of a mechanical effect of muscle paralysis, the other supposes that the phenomenon can be attributed to a cochlear affection and that the abnormal experience is merely the result of recruitment. These points of view have been reviewed very adequately by Jepsen[3] in his thorough monograph on the stapedius reflex.

Jepsen reviews his own investigations in which he correlated the experience of what he calls "phonophobia" (but also means the abnormal sense of discomfort) with the presence of facial palsy. He found "phonophobia" far more prevalent in patients with complete facial palsy than in those patients with partial function of the facial nerve. He concludes, quite definitely, that "phonophobia" in patients with facial palsy is the result of paralysis of the stapedius muscle. He pointed out further in his discussion that normal sensitivity seems to be necessary in these patients if they are to experience this discomfort to louder sounds.

The mechanism for this complaint has never been clearly established. The problem appears even more complicated in view of the fact that few of those individuals who have undergone any operation that cuts the stapedius muscle or removes the middle ear completely com-

plain of a painful experience in the presence of loud sounds. The mechanism by which acoustic abnormalities can be produced through alterations in the middle ear is extremely important to the surgeon operating on the middle ear.

The following specific questions can be raised:

1. Do the intratympanic muscles serve as a device for damping the vibration of the middle ear so as to extend the acoustic range, making loud sounds more tolerable and less injurious?

2. Does the chain of ossicles with one or both muscles cut become "sloppy," so as to introduce acoustic abnormalities through its nonlinear response to forced vibration?

3. Aside from loss in sound transmission, are there possible acoustic abnormalities likely in the response to high-level sound of an ear that is (a) normal, (b) has the middle ear muscles cut, and (c) has no ossicular chain?

Recording the cochlear potentials reveals the acoustic characteristics of the ear up to the region from which the potentials arise. Since the entire range of response resulting from extremely low levels to injurious levels of sound can be recorded, any characteristics attributed to the middle ear will become obvious. Two investigations relating resting-muscle effects and magnitude of response have been published using this technique. They have, however, more or less contradictory results.

Ruben and his colleagues[4] cut the stapedius muscle while recording the cochlear microphonics in man and found a change from 36 microvolts to 42 microvolts. Although there was no standardization of the sound stimulus and the improvement amounts to only 1.5 db, there is the indication that for a given sound input to the ear it sounds louder when the stapedius is cut.

On the other hand, Galambos and Rupert[2] report the opposite effect from recordings made from an unanesthetized cat. These investigators prepared a number of cats with implanted electrodes on the round window of each ear. On one side the two intratympanic muscles were cut and on the other the middle ear was left intact. These ears were stimulated by sound and the electrical responses of the ear recorded by photographing the tracings of a cathode-ray oscilloscope. From their experiments, they concluded that in the unanesthetized animal the muscles provided no mechanical support to the ossicular chain and exert a negligible influence upon sensitivity. As the sound intensity is raised, the round-window responses were reported to differ markedly in the ears with intact muscles from the responses in the ears with muscles cut. They were unable to separate the factors responsible for the differences, but the published CRO pictures show the initial responses of the ear with muscles to be greater than the response from the ear with cut muscles. This observation assumes that the gain of the amplifier channels from the two ears was the same.

Obviously there is no conclusive evidence to support the long-standing notion[5] that the muscles, through their attachments, assist the suspensory ligaments in providing support and tension to the ossicular chain.

In order to investigate this problem, several cats were prepared in our laboratory with electrodes implanted on the round window. Several had the muscles intact, others had the muscles cut and one was prepared in the manner of those of Galambos and Rupert: one side with muscles intact, the other with muscles cut.

Each of these animals was then placed in a sound field the intensity of which could be steadily increased over an 80 db range at any desired sweep rate. The cathode-ray oscilloscope is unsatisfactory for recording such an extended range because without switching gain or providing a logarithmic-amplifier channel the screen will show a limited range of about 20 db. In order to get the entire response the X-Y recorder was used and the input-output function of the animal recorded automatically with an intensity sweep rate of 10 db per second.

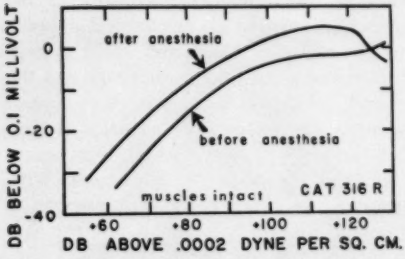

FIG. 1—Intensity functions recorded by means of implanted electrodes from the ear of a cat with intact middle ear muscles. These muscles in the awake cat provide a damping tension which reduces the transmission by about 10 db at low intensity levels, increasing to over 30 db at high levels and protecting the inner ear from the damaging overload region. Conversely, relaxing the muscles increases the magnitude of the response.

The intensity was so adjusted that the 80 db sweep would produce a sound at its most intense level somewhat more than that necessary to produce the maximum response from the animal. This was done because we were interested in finding out whether or not the muscles in their normal state provide some element of support to the ossicular chain. We wished to know whether or not cutting the muscles to the ossicular chain allows it to operate in a "sloppy" manner at high-sound levels or produces a greater response (louder) than for an equally intense sound when the muscles are intact. From a series of experiments we are carrying out on the middle ear muscles, a few results have been extracted to report here for their possible clinical significance.

Figure 1 shows the results typical of several cats studied in this series. The two curves represent the input-output function from a cat with middle ear muscles intact. The lower curve was recorded while the animal was awake and fully active. The upper curve is the record made after the animal was deeply anesthetized with sodium pentobarbital. Identical results were obtained from three cats and one guinea pig, all with implanted electrodes.

Several characteristics of these curves are worthy of note. In the first place it is obvious that the muscles in their normal state exert a damping effect of about 10 db upon the sound transmission of the ossicular chain. This attenuation becomes greater as the intensity level is raised, so it would appear that at low sound levels, over the course of the range of linear response, the damping effect can be attributed to the mechanical support and tension provided by the active tonus of the two muscles. As the nonlinear region of the response is reached, the damping effect becomes greater. For example, a sound pressure of 66 db above 0.0002 dyne per square centimeter is required in the animal with relaxed intratympanic muscles (anesthetized) to give the same response that requires 76 db in the animal which is awake. If this can be applied to human hearing, it means a tone will sound louder to a person with nonfunctional muscles than it will to one whose muscles are functioning. Although clinical reports state that stapedius paralysis does not change threshold sensitivity, these experiments indicate that stapedius nonfunction might produce a possible 10 db increase in sensitivity.

In most middle ear procedures that remove the ossicular chain or cut the muscles, other acoustic attenuation produced by the procedure may obscure this 10 db advantage.

However, the middle ear muscles produce advantages at high sound levels. Referring again to figure 1, it can be seen that a sound-pressure level of only 92 db gives the same cochlear output with relaxed muscles as a sound of 122 db with the muscles present. Whether this great increase in attenuation can be accounted for by an increasingly greater contraction of the muscles or merely by the damping effect of the resting tonus is the subject of further study, but it is apparent that these muscles protect the ear for the types of stimulus presented here. In fact, at a stimulus level of 120 db, when the cat is under anesthesia the ear is extremely overloaded and the output is beginning to decrease in magnitude from the maximum. Beyond this, the ear would be damaged if the sound persisted. When the muscles are active (the animal awake), the maximum response is not reached even at 130 db. It is obvious that what an ear may lose in sensitivity is more than compensated for by the advantages of protection at high sound levels, at least for the type of stimulus described here.

The lack of the increasingly effective attenuation produced by the middle ear muscles may account for the "hyperacusis" at high levels in the cases of stapedius paralysis in facial palsy.

Figure 2 shows the results of anesthetizing a cat in which the muscles had been cut in an earlier operation. The cat of this figure is the same as that of figure 1, but it is the opposite ear. With no muscles present, there is very little difference in the intensity functions under the awake condition and under anesthesia. A maximum is reached and a decrease in response, indicating incipient injury, follows on increasing intensity. If the anesthesia does anything, it may reduce the response somewhat. This is opposite to the effect in the animal which is awake and in the anesthetized animal with muscles present.

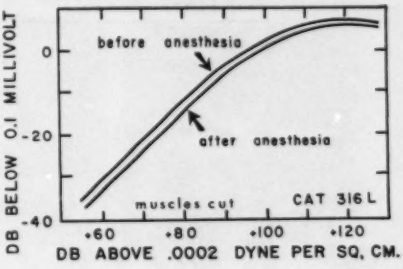

FIG. 2—Intensity functions from the opposite ear of the same cat as in figure 1, recorded by means of implanted electrodes. In this ear the muscles have been cut and anesthesia makes very little difference in the response.

It is obvious, therefore, that the middle ear does not become "sloppy" with the cutting of the muscles or under conditions that cause their relaxation. The next problem was to discover whether there was any difference between the response recorded from an ear with muscles relaxed by anesthesia and the response recorded with the muscles cut. Opposite ears of the same animal were both implanted with electrodes (figs. 1 and 2), and there is always the possibility that the electrodes at the two round windows were not identically placed, so the shapes of the curves from the two ears, although in this instance appearing almost identical, are not necessarily comparable.

Several other cats, therefore, were deeply anesthetized and operated upon to expose the middle ear. A platinum foil was placed upon the round window and an intensity function reading taken.

After the intratympanic muscles were cut and another function reading taken, the ossicular chain, including the crura of the stapes and the attached stapedius muscle, was then removed and the sound-conducting probe was sealed in over the oval window. A final intensity function reading was then obtained.

possibility has still remained that at very high levels of sound an ossicular chain without attached muscles may respond in a nonlinear manner. At very high levels of sound the response of the inner ear goes through a maximum and then decreases. When this effect is viewed on a cathode-ray screen, the pic-

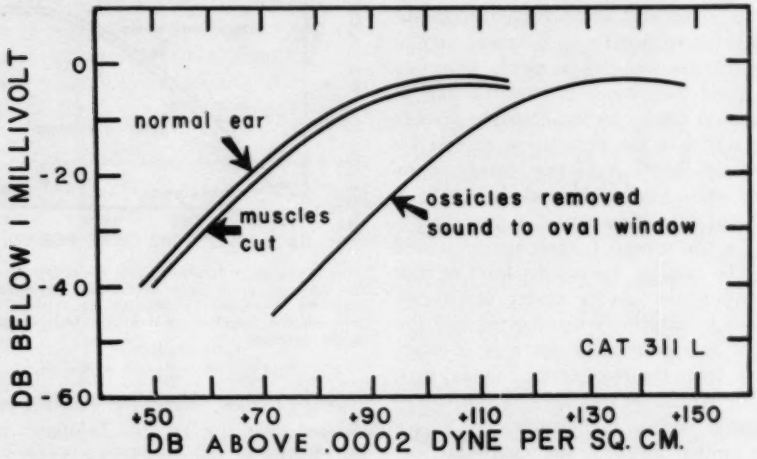

FIG. 3—Intensity functions recorded by means of a platinum-foil electrode on the round window of an anesthetized cat. Muscles relaxed by anesthesia have no more effect than cut muscles, and the ossicular chain does not become "sloppy" by removal of muscles. Except for loss of sensitivity, the curve of the cochlear response is the same shape over an increasing intensity range with and without the middle ear.

Figure 3 shows the resulting record of functions. Except for the 30 db transmission loss caused by the removal of the ossicular chain, the three curves are identical. Apparently anesthesia has the effect of relaxing the muscles completely, and there is no difference between this situation and that of both muscles cut. The ossicular chain does not become "sloppy" under these conditions; there is no difference in the shape of the curve except for loss of sensitivity after removal of the chain. The fact that amplitude distortion in the ear is not caused by the middle ear has been conclusively shown in previous experiments,[5] but the

ture is very similar to that shown when the inner ear muscles act by reflex to clamp down on sound transmission through the middle ear and, if careful experimental control is not observed, may be mistaken for such a reflex. This inner ear effect, however, can be used to study the actions of the middle ear with and without muscles.

Figure 4 shows cathode-ray pictures of the responses of two animals to these high-level sounds. There is a marked resemblance between these responses and other published pictures[2] of intratympanic muscle reflex, but those shown

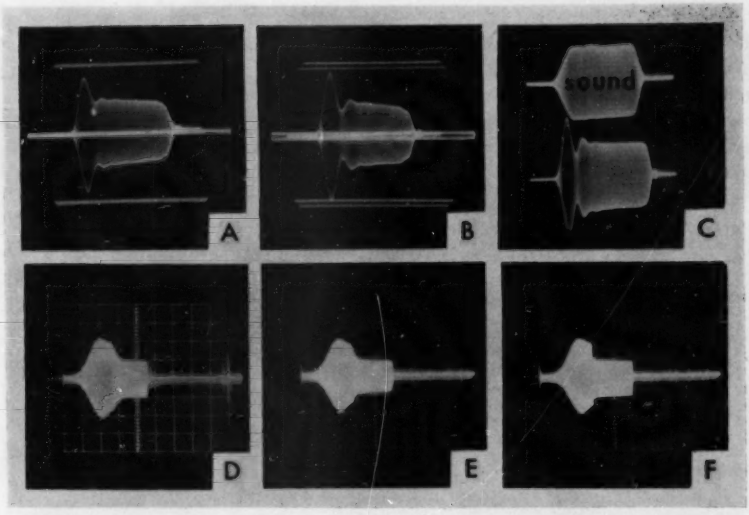

FIG. 4—Cathode-ray pictures of the inner ear response at high sound levels. In pictures A, B and C the sound reaches a maximum of 140 db (top of picture C). The decrease in response is caused by overloading the inner ear. In A the animal is anesthetized and both muscles are present. In B the tensor tympani is cut, and in C both muscles are cut. There is no difference in the shape of the response. Pictures D, E and F are records of the responses of another animal with the sound reaching a maximum of 110 db. In this case the stapedius was cut first (picture E). Again there is no significant difference in the response. Evidently, even at high sound levels the ossicular chain responds the same whether the muscles are cut or not cut, although the protective reflex is gone.

here are the result of overloading the inner ear at high levels.

The top row of pictures represents the responses to successive stimuli at 140 db above 0.0002 dyne per square centimeter. Picture A represents the response of an anesthetized animal with an intact ear. In B the tensor tympani had been cut, and in C both muscles had been cut. The upper trace in C is of the sound, to show that it increases and holds at the high level without overloading the equipment. The trace records only about the last 20 db of the sound as it is raised to 140 db and held for one second. There is a rapid drop in the response after the maximum is reached, but, as plotted intensity functions confirm, this amounts to only about 6 db. Pictures A, B and C show no significant difference, from which it can be concluded that the muscles provide no resting support to the ossicular chain in the anesthetized animal. The ossicular chain can respond perfectly well without the muscles, but the muscles do have a damping and protective effect in the animal which is awake (fig. 1).

In figure 4, D, E and F represent responses of another animal to a sound increasing to 110 db. In this animal the stapedius muscle was cut first (fig. 4, E). Again the different conditions do not give rise to different responses.

There is considerable to be learned about the middle ear muscles, and the Galambos technique has much to offer. In the awake animal, these muscles provide a tension that attenuates the ossicu-

lar vibration and perhaps provide a gradually increasing tension at high sound levels that may account for the extended range of response and serve to protect the inner ear structures. Clinically, paralysis or cutting of the muscles may account for an abnormal experience of loudness for normal sounds and may allow the inner ear to be exposed to greater amplitudes of vibration.

ing properties of the middle ear. The anatomic relationship of the bones of the ossicular chain was important to this theory, and Wrightson seems to have had some peculiar notions as to the actual situation. However, there has been sufficient speculation about the value of the rocking motion of the stapes to cause the question to be raised whether some of the modern surgical techniques involving the middle ear do not disregard this principle and perhaps lose some available advantages. This is an especially pertinent question in the case of those operations that abolish the normal footplate and utilize either a vein or fragment of bone.

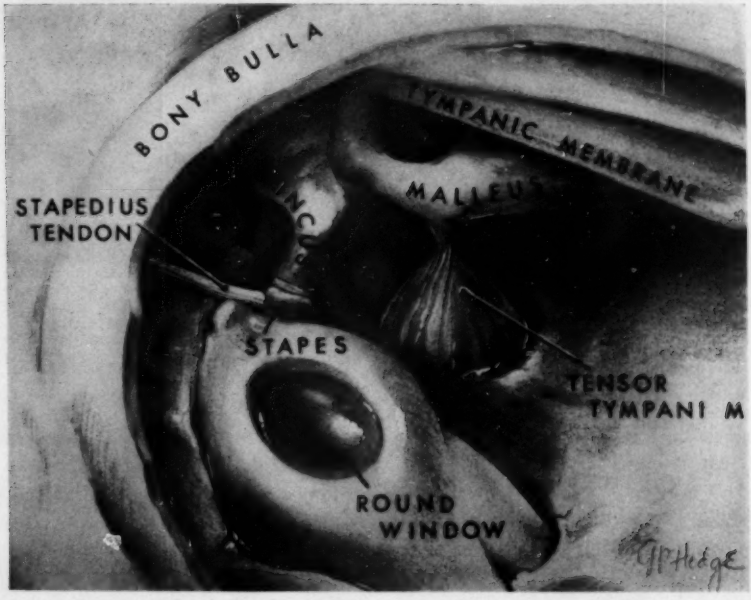

FIG. 5—The normal middle ear of a cat as seen after the bulla has been opened and the septum removed. The electrical response is recorded by placing a platinum-foil electrode on the round window membrane.

The Effects of Angle of Force Acting Upon the Stapes and of Mass Upon a Substitute Transmission System

Békésy[1] has described the action of the normal stapes as it rocks about a vertical axis at normal levels of sound. Wrightson and Keith,[6] somewhat earlier, built up a theory that the hinging process provided for a stapedial lever that further aided the impedance match-

In order to test the notion that the angle of operation of the footplate of the stapes is important to hearing, a se-

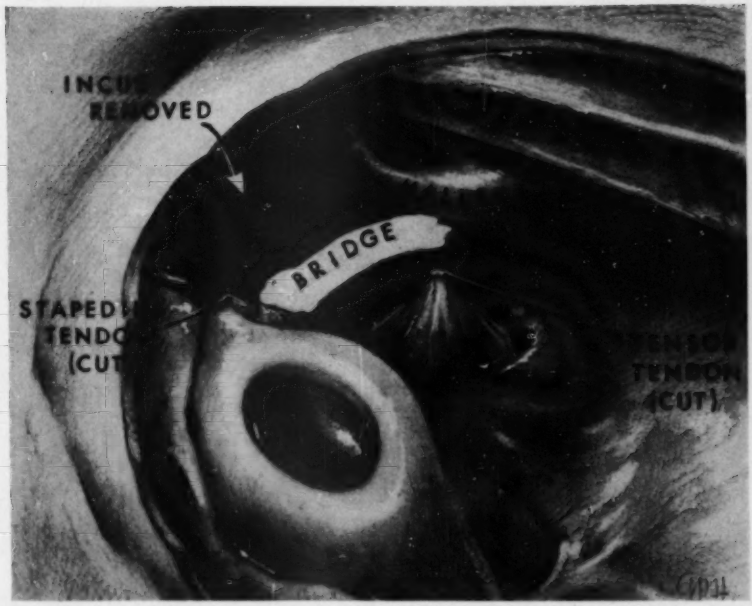

FIG. 6—The middle ear of a cat after removal of the incus, cutting of the muscles, and construction of a dental-cement bridge between the malleus at the point of junction of the bony projection into which the tensor tympani is inserted and the capitulum of the stapes.

ries of cats was operated upon, and a dental-cement bridge was built between the malleus and stapes in each cat so as to vibrate the stapes at a side angle rather than from a force directly in line with the crura, as is provided by the normally functioning incus.

Figure 5 is an artist's drawing of the normal middle ear structures of a cat. The tympanic bulla has been nibbled away, and the bony septum that acts as a partition within the bulla cavity has been removed to leave the structures exposed for further manipulation of the middle ear structures.

The first surgical procedure involved removing the incus and the head of the malleus. The head of the stapes and a small area of the manubrium of the malleus were then cauterized in order to dry the surface thoroughly, and a dental-cement bridge was carefully built up between the two bones. In some animals the muscles were cut but, as shown previously, this makes no difference in the anesthetized animal.

Figure 6 is a view of the completed bridge. It is obvious that now the force to the stapes is applied almost at right angles to that usually produced by the incus. The head of the malleus is shown intact, but in this first experiment it was removed.

In order to record the effects of the cement-bridge procedure, a recording of the sensitivity of the ear for various frequencies was made prior to the removal of the incus. This was accomplished by placing a platinum-foil electrode on the round window and amplify-

ing the potentials arising from the inner ear. Sensitivity was plotted as the amount of sound pressure necessary to produce 10 microvolts of response at the various frequencies. Following removal of the incus and the head of the malleus another sensitivity run was made. The dental-cement bridge was then constructed and another sensitivity measure taken.

cps to 7000 cps shows a loss of approximately 24 db.

Aside from the loss of the middle-ear-lever action, which amounts to only 2.5 db, there were three possible explanations for the fact that there was not complete improvement: (1) the improper angle of operation of the stapes, (2) the abnormal weight of the bridge, and (3) the improper action of the tym-

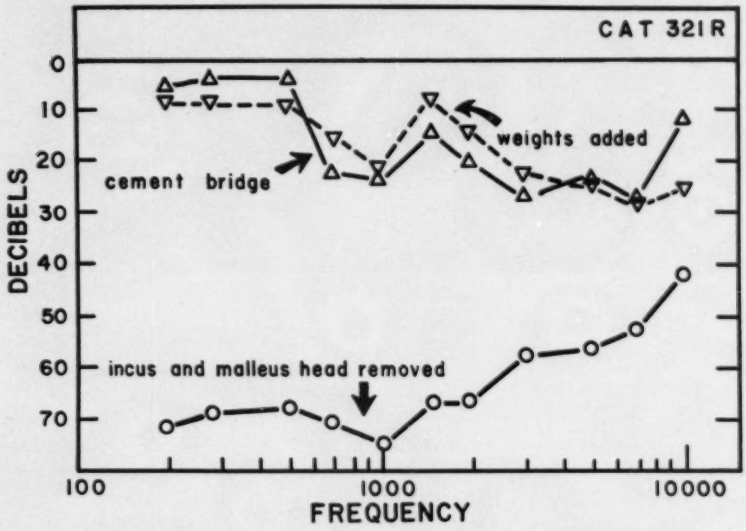

FIG. 7—Ten-microvolt sensitivity curves of the responses to various frequencies after removal of the incus and head of the malleus, and then after construction of the dental-cement bridge and addition of lead weights.

Figure 7 shows the results of this experiment. The lowermost curve shows the effects of incus removal. For frequencies from 200 cps to 1000 cps the loss amounts to 70 db, and it becomes progressively less for the higher frequencies. The curve so indicated shows the extent of improvement following the construction of the bridge. The improvement is greatest for the high and low frequencies. The middle range from 700

panic membrane and malleus produced by removal of the head of the malleus and the incus. The first procedure employed to test these possibilities was to glue lead weights to the bridge.

Two squares of lead totaling in weight about 25 mg., or approximately six times the weight of the stapes, were placed at the center of the bridge. A comparison of the curves before and

after the weights were added indicates an improvement of about 5 db throughout the middle range of frequencies, and a loss at the frequencies below 500 cps and above 7000 cps (fig. 7).

Measures of bone conduction were also taken during the above procedures. A crystal vibrator was placed on the mastoid behind the external meatus after the bulla had been opened and a platinum foil placed upon the round window.

The improvement shown in the air-conduction curves by the adding of the lead weights would indicate that the weights have corrected something in the system that had been changed either by the new angle of movement of the stapes or by removal of the head of the malleus and of the incus. With this surgical approach, the bridge connecting the malleus and the incus could be built in no other way; therefore, the next step in another animal involved leaving the mal-

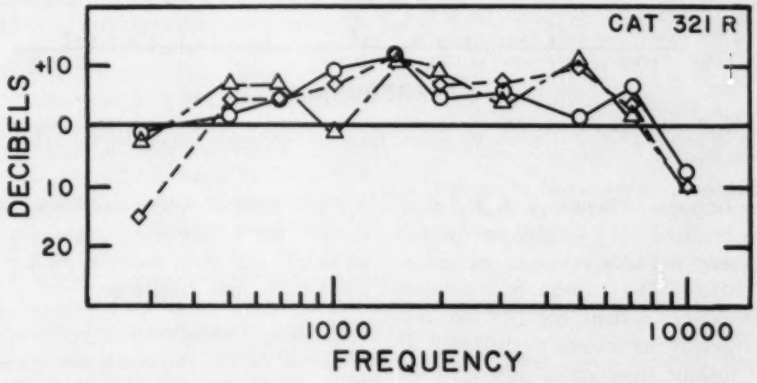

FIG. 8—Bone-conduction sensitivity curves after removal of the incus (solid line with circles), after completion of dental-cement bridge (dashed line with squares), and after adding weights (intermittent line with triangles). All conditions make little difference to bone conduction.

The voltage across the vibrator necessary to produce 3 microvolts of response was determined and used as the normal bone-conduction sensitivity for this animal. This is represented by the zero line of figure 8. The three curves in figure 8 show that, in general, the surgical procedures improved bone conduction by about 7 to 8 db, but that there was very little gained by the presence of the bridge or by the adding of the weights. At the extreme ends of the frequency range, where air conduction was aided the most by the placement of the bridge, bone conduction is made the least sensitive.

leus completely intact, removing the incus, and then connecting the two with dental cement.

Figure 9 shows a return of cochlear output to within 5 db of the normal level for the middle range of frequencies. For some reason the initial loss was about 10 db less than that of the previous animal. The pattern of loss is also different, but there is consistency in the finding that by weighting the substitute system or leaving the head of the malleus intact, better improvement can be obtained. It may be that the head of the malleus provides a balance to the membrane-malleus system which makes for

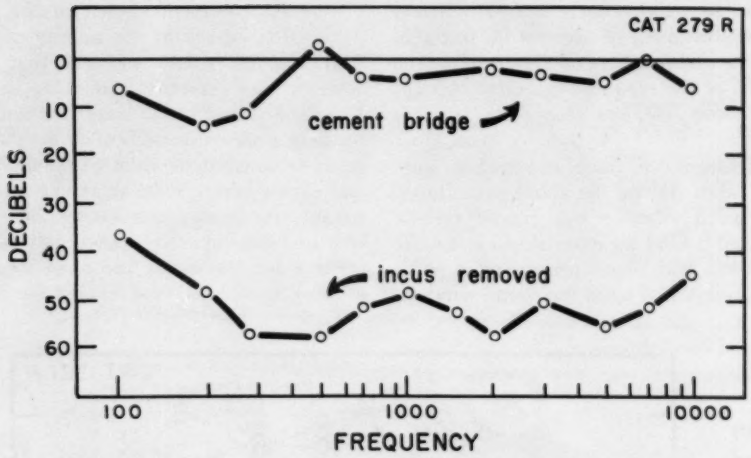

FIG. 9—Ten-microvolt sensitivity curves of the responses to various frequencies after removal of the incus only (head of malleus left intact). The bridge now restores hearing almost to normal.

better response. There may be two principles involved: (1) leaving the malleus intact may not only maintain the necessary balance and tension to the membrane-malleus system, but (2) also certainly avoids the trauma to the fibers of the tympanic membrane caused by the manipulations necessary to cut the neck of the malleus. We do not yet have sufficient information to analyze these factors in detail.

CONCLUSIONS

This report has dealt primarily with the clinical aspects of research data that are to appear in more detail in other publications. There is so much that is not yet known about the auditory abnormalities that may arise from manipulations of the middle ear that caution should accompany the evaluation of a new surgical technique. There is more to hearing than threshold measures indicate. Creating a new situation in the middle ear may restore hearing to the practical level as determined by an audiometer, but it may bring about hearing anomalies that make listening unpleasant and loud sounds dangerous.

Creating a situation that removes the influence of the intratympanic muscles can apparently create such auditory problems. The middle ear muscles provide a damping influence upon the vibrations of the ossicular chain and protect the inner ear from excessive amplitudes of vibration associated with the higher sound intensities. Loss of these muscles may bring about the abnormal discomfort to sounds at moderate levels (occasionally called *hyperacusis*) often experienced by patients with stapedius paralysis. This effect may not always be seen in cases operated upon for conductive deafness because the resultant residual conductive loss may counteract the increase in sensitivity gained by cutting or bypassing the stapedius muscle.

However, loss of the muscle action does not remove support from the os-

sicular chain. If anything, freedom from the tension of muscles allows the chain to respond in a more linear manner to higher levels of sound, which permits the inner ear to overload at a lower sound-pressure level. The chain of bones does not, however, become "sloppy" or tend to introduce distortion itself at an appreciably lower sound-pressure level.

In procedures that involve the cutting of either one or both of the muscles, there is generally a rearrangement of the middle ear either by substituting a prosthesis for the stapes or altering the middle ear by removal of parts and replacement of skin flaps to satisfy the necessary acoustic principles. In answer to many questions that have been raised in connection with the newly created middle ear, experimental evidence indicates that the angle of application of force at the oval window is of little importance as long as it is free to vibrate. One can also conclude from the reported experiments, although they have not recreated the actual surgical situation, that within limits the weight of a prosthetic substitute for the stapes makes very little acoustic difference to the sensitivity to vibration of the middle ear structures.

One of the more important relations is that of the tympanic membrane and malleus. Lack of trauma to the fibers of the membrane and the presence of the head may be very important to the proper operation of these structures, and such operations as fenestration may benefit by the presence of the head on the malleus, not only to provide balance to the repositioned tympanic membrane but to avoid the trauma occasioned by the head's removal.

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STAPES SURGERY: PATHOLOGIC INDICATIONS FOR THE BYPASS OPERATIONS AND THE VEIN GRAFT

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Introduction

Shea's concept of the fenestration of the oval window with the removal of the otosclerosis and the reconstruction of an ossicular chain[25] is to me one of the great contributions to the field of ear surgery; it is indicated when the otosclerosis needs to be removed. With the acceptance of the basic principles of Shea's technique, we are now faced with the decision of whether we shall employ routine stapedectomy and the vein graft or insist upon accurate pathologic diagnosis and the application of the variable operations which utilize normal portions of the stapes. First, let me state that most of us in this field have been disappointed in the long-term results of total mobilization of the stapes; in total mobilization, the fracture line extends through the otosclerosis and, with healing, there is a high incidence of refixation and resultant disappointment. To avoid this refixation, many otologists now employ the "bypass" method. The basic principle of the bypass stapes operations is avoidance of the otosclerosis and utilization of the normal portions of the stapes, applying such surgical techniques as the anterior crurotomy, crural repositioning, or artificial crura.

Bypass surgery of the stapes requires a microscopically accurate interpretation of the existing pathologic circumstances and microscopically accurate surgical technique which avoids the otosclerosis and/or other anatomic or pathologic causes for refixation of the stapes. When these requirements are fulfilled, the bypass operations will give nearly complete closure of the air-bone gap, without the immediate or delayed labyrinthine disturbance which is encountered in the fenestration of the oval window and vein graft.

From the beginning of this renaissance in stapes surgery, my major interest has been in the anatomic and pathologic variations in the otosclerosis of the stapes and their influence on stapes operability (Farrior[4,5]; Bellucci[2]; Hough[10]). My library now contains more than twenty-five hundred microphotopathologic slides demonstrating these variations. These studies began in the fenestration era before I accepted the feasibility of stapes surgery, and they have extended through the more than six hundred stapes operations and the concomitant 222 fenestration operations out of a total series of 1,413 operations for otosclerosis. We now have three-dimensional photopathologic slides illustrating nearly five hundred consecutive operations for otosclerosis. Although only six classical fenestration

I wish to express my gratitude to Dr. Robert Iglesias, otolaryngologist, for the preparation of the illustrations.

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operations (Lempert[16]) were performed during the course of the last one hundred stapes operations, the earlier fenestrations provided an excellent opportunity for the study of the pathology of otosclerosis through the removal of the stapedial arch and the mucous membrane from the footplate, thus revealing more accurately the microscopic extension of the otosclerosis.

The thesis of all of these studies is that there are specific pathologic indications for the various operations for otosclerosis. I do not advocate conservatism. I do advocate microscopically accurate surgical technique based upon a microscopically accurate pathologic interpretation of the existing disease, the utilization of the uninvolved portions of the stapes and, where possible, avoidance of the substitution of grafts or foreign bodies. The purpose of this presentation is to demonstrate the pathologic indications for and the pathologic limitations of the variable operations on the stapes and oval window including anterior crurotomy, total mobilization, crural repositioning, artificial recruralization, subtotal footplate fenestration, and fenestration of the oval window.

Anterior Otosclerosis

ANTERIOR CRUROTOMY

The anterior crurotomy of Basek and Fowler[1] is to me one of the best operations upon the stapes. Anterior crurotomy (fig. 1) is indicated in anterior footplate or anterior crural otosclerosis, when the posterior portion of the footplate is uninvolved and when the posterior crus stands free in the middle ear space. Anterior crurotomy is the operation of choice in all anterior otosclerosis. Anterior crurotomy is indicated when the otosclerosis extends along the inferior margin (or, more rarely, the superior margin). In these circumstances, the fracture line must extend through the normal footplate away from the marginal otosclerosis. If the posterior crus is in contact with the inferior lip of the oval window niche, or if there is any indication of otosclerotic fixation of the posterior crus, then, as an adjuvant to anterior crurotomy, the posterior crus is fractured away from the margin and replaced over the mobilized central area of normal footplate.

Results

Following the thesis of specific pathologic indications, anterior crural otosclerosis was diagnosed and anterior crurotomy was performed in 32.5 per cent of cases in the last two hundred stapes operations. Of these 65 anterior crurotomies, 83 per cent have remained successful, with better than 75 per cent closure of the air-bone gap and with no case having been made worse.

Pathologic Failures

The greatest pathologic causes for failure of the anterior crurotomy are undiagnosed inferior marginal otosclerosis, untreated posterior crural otosclerosis, and trauma to the posterior crus and inferior margin of the oval window niche with resultant postoperative fibrous fixation.

My failures in anterior crurotomy (17 per cent) have usually occurred in those cases in which I extended the use of the crurotomy technique beyond its pathologic indications. That is, when I hopefully employed anterior crurotomy even though there was otosclerotic invasion of more than half of the footplate or mobilization occurred in posterior crural otosclerosis.

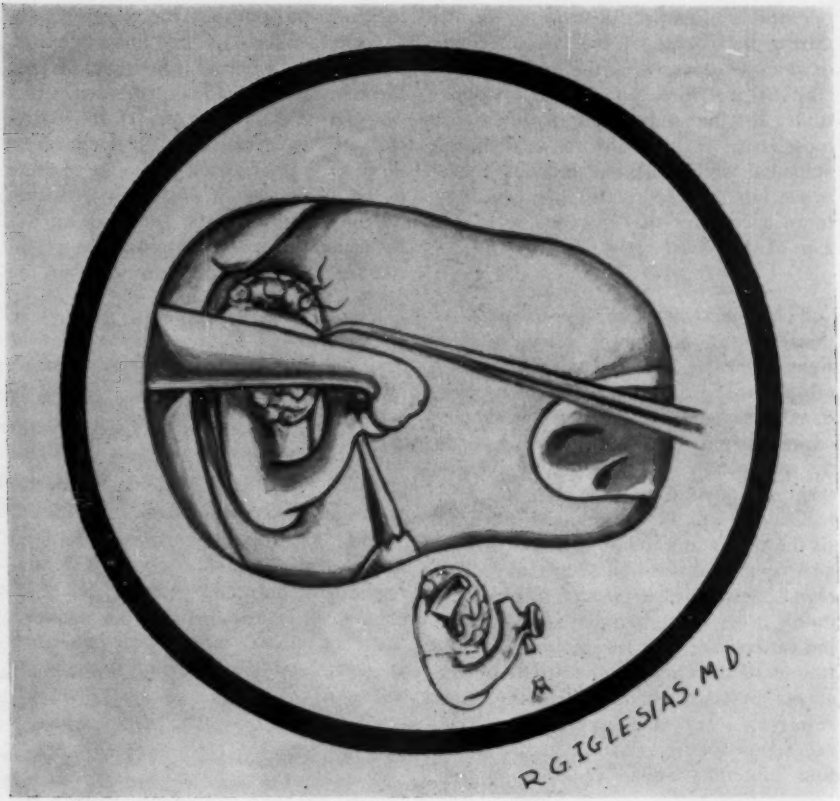

FIG. 1—Anterior crurotomy is preferred in all anterior otosclerosis. The object of the anterior crurotomy is to bypass the otosclerosis by removing a section of the anterior crus and mobilizing the normal posterior portion of the footplate.

Surgical Technique

Having established the diagnosis of anterior otosclerosis, the anterior crurotomy is performed with a slightly curved chisel. The sharp, curved chisel is placed over the incus onto the anterior crus in its straightest portion (fig. 1). The anterior crus is shaved by pushing gently, directly toward the otosclerotic fixation. The anterior crus is gradually thinned and cut with 25 to 70 shavings. The buttress or stump of the anterior crus is then folded forward in order to obtain good space between the two sections of the anterior crus. This stump may or may not be removed. The space between the ends of the anterior crus is then checked with a right-angle pick.

Footplate Fracture

The posterior portion of the footplate is then mobilized with a small pick or chisel. I usually prefer the pick because it can be inserted to either side of a footplate blood vessel; a chisel might cut the blood vessel and produce undesirable bleeding. The pick is inserted behind the

incus into the area of normal footplate immediately posterior to the anterior crus. The fracture line in the footplate extends along the inferior margin to the posterior crus, extending through normal footplate. This inferior marginal fracture line has become routine in order to avoid refixation by inferior marginal otosclerosis. The inner (anterior) surface of the posterior crus is then palpated to make certain that it is fully mobilized. If there is significant fixation of posterior crus or if there has been a posterior crural fracture, posterior crural repositioning is employed, placing the end of the posterior crus over the normal mobilized impacted central area of the footplate (Farrior[6]; Juers[13]).

Tendotomy

Formerly, I routinely sectioned the stapedius tendon whenever I performed an anterior crurotomy. The stapedius tendon was sectioned primarily to aid in the diagnosis of posterior crural or inferior marginal otosclerosis. I now employ tendotomy only when there is a possibility of posterior crural repositioning. Routine tendotomy has been abandoned with the hope that the tension of the stapedius muscle would produce a slight tilt in the remaining portion of the footplate, separating the fixed anterior segment and the mobilized posterior segment, and that this separation at the footplate fracture line would encourage healing by the muco-endosteal membrane and thereby effect a permanent mobility.

Other Crurotomy Techniques

The shaving-chisel anterior crurotomy technique has been adopted by the process of elimination of other crurotomy techniques because they produced too high an incidence of total mobilization of the stapes or fracture of the posterior crus. With this chisel technique, all thrust is directed toward the otosclerotic fixation, while with most anterior crurotomy knives, the force is at an angle to the fixation and there is a higher incidence of total mobilization. I like Juers' saw[13] with less angle, so that the force is still directed toward the fixation. Although I have Guilford's crurotomy electric saw,[8] I have not employed it because I have been reasonably happy with the above described technique. In a contemplated anterior crurotomy, Shea[24] employs primary footplate fracture and posterior crural mobilization; in planned anterior crurotomy, I have abandoned primary footplate fracture because of the high incidence of total mobilization of the stapes and fracture of the anterior crus.

TOTAL MOBILIZATION (DIRECT AND INDIRECT)

Total mobilization of the stapes, either by the indirect or by the direct method, is not regarded as an operation of choice because of the high incidence of refixation even in selected cases with minimal otosclerotic invasion. Because of its universal usage, total mobilization of the stapes (Rosen[18]) has given more people good hearing than all other techniques together, and this grand total of good results is not to be forgotten. Nevertheless, on a percentage basis, the high incidence of refixation has led us to discard total mobilization of the stapes as an operation of choice in favor of bypass surgery. Total mobilization of the stapes (fig. 2) is now voluntarily utilized only when the pathologic changes are minimal and the stapes is so deeply placed in the oval window niche that bypass surgery cannot be employed without trauma to the margins of the stapedial crura and the oval window niche.

Results

In selected cases with otosclerosis limited to the anterior footplate, refixation has occurred in about 40 per cent of cases. In a previous one hundred

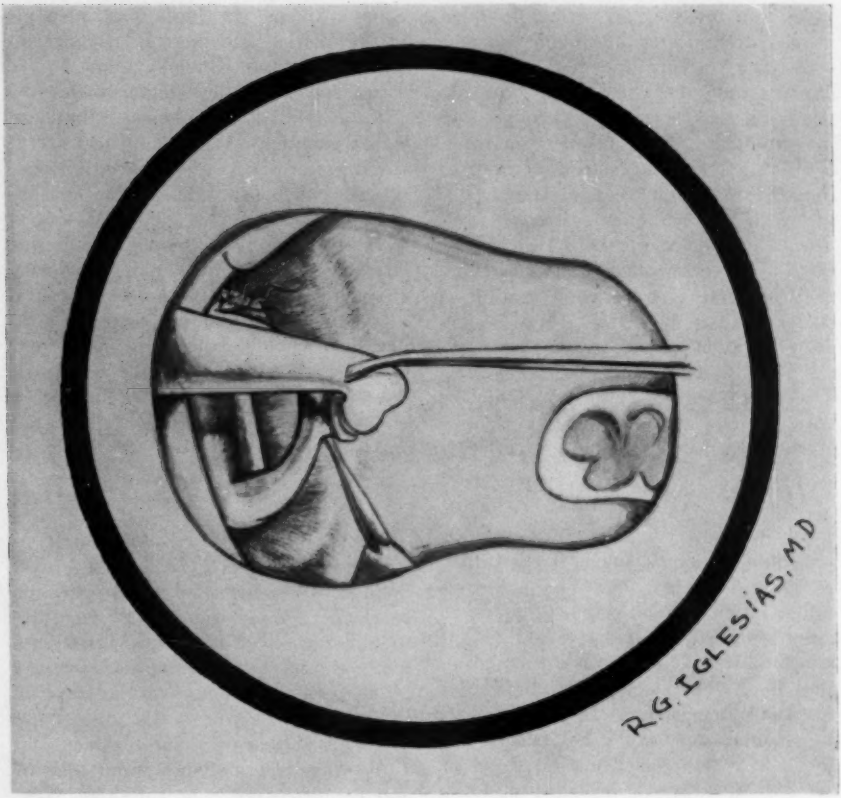

FIG. 2—Mobilization of the total stapes is now rarely performed as an operation of choice because of the high incidence of refixation. Using the anterior crurotomy approach, total mobilization will result when the diseased area is minimal. In these cases (16 per cent) the restored hearing is frequently lasting.

cases (400-500), minimal anterior footplate otosclerosis was found in 37 per cent. I then regarded total mobilization as the operation of choice. In fourteen of these cases, the stapes was very deeply placed in the oval window niche and indirect total mobilization was performed. Even in these anatomically and pathologically selected cases for indirect total mobilization, refixation has occurred in 43 per cent.

In these thirty-seven cases with minimal anterior footplate otosclerosis, total direct mobilization was accomplished with the pick or chisel in twenty-three patients. Refixation has occurred in 39 per cent of cases. When the pick or chisel is inserted anteriorly, a significant labyrinthine disturbance may frequently be encountered. In one of these patients, there was a marked loss of hearing for the high tones.

When total mobilization of the stapes is employed in all cases regardless of the pathological circumstances, a high incidence of primary success may be obtained with picks, chisels, microdrills (Rosen[19]; Goodhill[7]; Schuknecht[20];

Heermann[9]; Kos[14]; Derlacki[3]; Portmann[17]), but the incidence of refixation is far greater than 50 per cent. Many surgeons motivated by these mechanical manipulations met with disappointment and, therefore, jumped directly to the vein graft, avoiding bypass surgery. But bypass surgery is not passé, as indicated by the high incidence of good and lasting results when the otosclerosis is bypassed.

Pathologic Failure

The pathologic causes of failure in total mobilization are crural otosclerosis, either anterior crural or bicrural, and thick footplate otosclerosis.

In a recent series of one hundred stapes operations, I attempted anterior crurotomy in all anterior lesions (50 cases). In these cases, the chisel was placed over the incus onto the anterior crus and an effort made to perform an anterior crurotomy. In sixteen patients, the fixation was so minimal that total mobilization of the stapes resulted. In these patients with minimal lesions, there has been only 15 per cent refixation; therefore, in such cases I am not yet willing to discard total mobilization, perform a stapedectomy and proceed with a vein graft or other interposition techniques.

The routine use of the anterior crural approach, attempting anterior crurotomy with the shaving chisel, will produce a minimal number of total mobilizations (16 per cent) and automatically eliminates many cases which are pathologically unsuitable for total mobilization surgery.

Bicrural Otosclerosis

In bicrural otosclerosis, refixation is almost certain after total mobilization. In bicrural otosclerosis it is technically difficult or impossible to mobilize or remove the uninvolved central portion of the footplate once the entire stapes is mobilized. Therefore, when the pathologic diagnosis of bicrural otosclerosis is established, the primary surgical attack is directed at the normal portion of the footplate. Only after this central normal portion of the footplate is mobilized do I proceed with crural repositioning or removal of the stapedial arch and artificial recruralization.

CRURAL REPOSITIONING

Crural repositioning is the operation of choice in bicrural otosclerosis with a wide area of normal footplate and a wide oval window niche (fig. 3). This pathologic circumstance occurs in 8 per cent of cases. Crural repositioning is also indicated in anterior and marginal otosclerosis when the posterior crus is fractured at the base during the course of the anterior crurotomy; in this circumstance, repositioning the posterior crus in the center of the mobilized normal footplate is additional insurance against crural refixation.

When both of the crura are fixed in the otosclerosis and there is a wide area of normal footplate in a wide oval window niche, this wide central area is first mobilized with the pick or chisel. An anterior crurotomy is then performed. The stapedius tendon is sectioned. The posterior crus is then fractured away from the otosclerotic area and repositioned over the mobilized central area of normal footplate. The posterior crus may be held in position with gelfoam in the posterior inferior portion of the oval window niche. Hydeltrasol is used on the gelfoam to avoid postoperative fibrous fixation (Shambaugh[23]).

Results

In the last one hundred cases, crural repositioning was employed in 8 cases

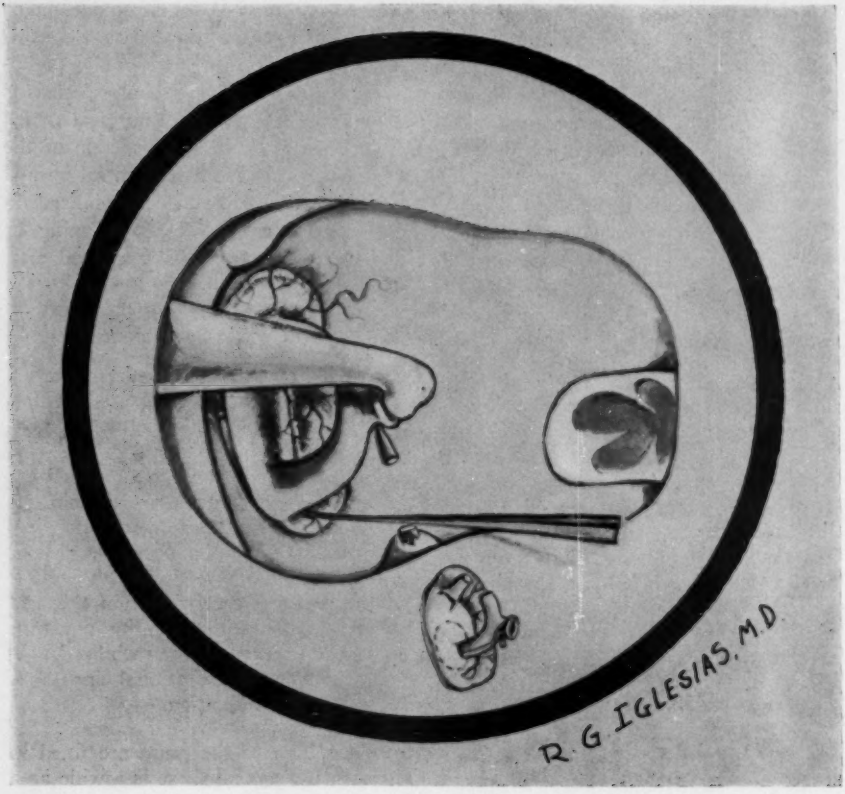

FIG. 3—Crural repositioning is indicated in bicrural otosclerosis with a reasonable area of normal footplate, when the diameter of the oval window niche is comfortably wider than the diameter of the remaining stapedial crus. These conditions are found in 8 per cent of the cases.

of bicrural otosclerosis. In six of the eight cases the operation was successful with nearly complete closure of the air-bone gap. Crural repositioning was employed in a few additional cases of anterior otosclerosis when the posterior crus was fractured in the course of anterior crurotomy; these cases are classified under "Anterior Crurotomy."

It is to be remembered that in working with normal viable crura there is always a tendency for these tissues to grow together; therefore, in crural repositioning the repositioned posterior crus must be situated well away from the margin of the oval window niche.

The pathologic causes of failure of crural repositioning are otosclerotic invasion of the footplate and osseous or fibrous refixation of the remaining posterior crus.

ARTIFICIAL RECRURALIZATION
STAINLESS STEEL CRURA
SUBTOTAL FOOTPLATE FENESTRATION

The use of artificial crura is pathologically indicated in bicrural otosclerosis with a narrow oval window niche

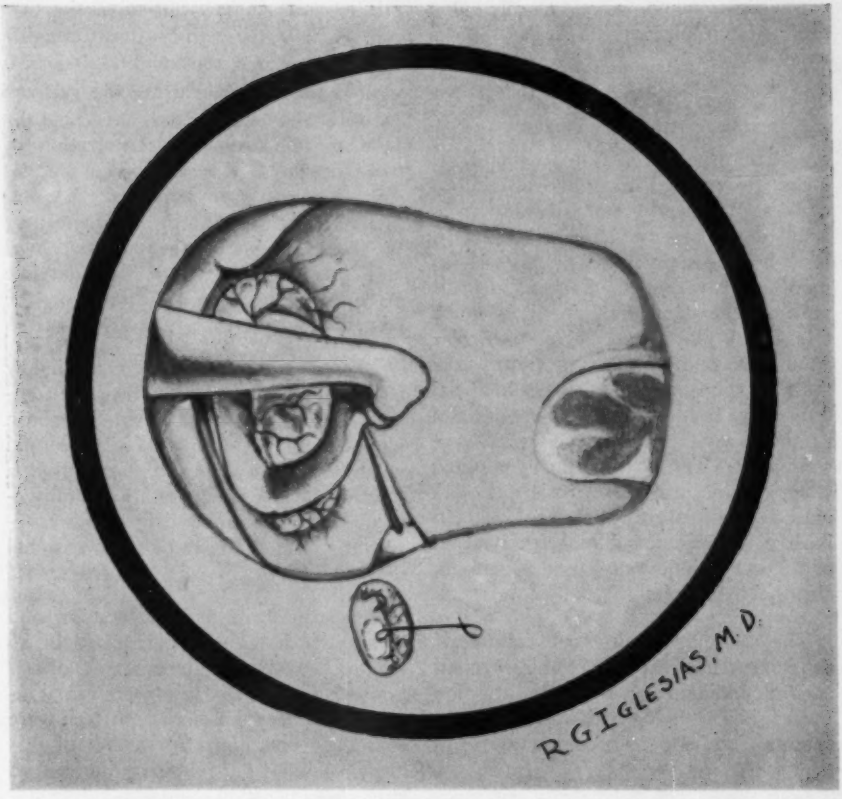

FIG. 4—The stainless steel stapes or polyethylene stapes is indicated in cases of bicrural otosclerosis with a reasonable area of normal, or near normal, footplate when the diameter of the oval window niche is less than the diameter of the remaining stapedial crus. Normal footplate is mobilized, but subtotal fenestration of the footplate is indicated when there is significant otosclerotic invasion of the footplate as shown in this illustration. Subtotal fenestrations of the footplate may be temporarily sealed with gelfoam.

and a wide area of normal footplate (fig. 4). Artificial crura may be combined with a subtotal fenestration of the footplate (House[11,12]) with a gelfoam pledget when there is questionable otosclerotic invasion of the footplate. Artificial crura are also useful in secondary stapes operations when there is crural destruction or fixation, but a reasonable area of uninvolved footplate remains.

To perform a total fenestration of a very deep oval window niche requires an extensive operation on the oval window, which, in turn, may produce profound postoperative labyrinthine disturbance. Also, in such a deep oval window niche, it is difficult to remove all of the mucous membrane; therefore, I prefer to perform the House subtotal fenestration of the footplate, removing a segment of the footplate with the pick without the use of the burr. This does not disturb the mucous membrane and does not produce excessive bleeding. Only in the subtotal fenestrations of the

oval window am I willing to rely upon the gelfoam pledgets to seal the oval window niche.

The stainless steel stapes (Schuknecht[21]) is the prosthesis of my choice, for it may be snugly fitted around the incus and inserted into the oval window niche and is thereby more likely to withstand the ravages of time. Technically, inserting the stainless steel stapes is far more aggravating than adjusting the polyethylene strut, yet I feel it is worth this extra effort and is of particular value in secondary stapes procedures. In the last one hundred cases, artificial crura have been used in 14 per cent. Six of these were primary and eight were secondary. The one failure resulted when the bicrural otosclerosis extended onto the footplate. In that case, I should have performed a subtotal fenestration of the oval window and used a gelfoam absorbable stopple.

The pathologic causes of failure of artificial crura are a prosthetic misfit and/or undiagnosed footplate invasion (which is a pathologic indication for the subtotal footplate fenestration).

Footplate Otosclerosis

FENESTRATION OF THE OVAL WINDOW
THE VEIN GRAFT

THE VEIN PLUG STAPEDIOPLASTY

SUBTOTAL FENESTRATION OF THE FOOTPLATE

ABSORBABLE GELFOAM STOPPLE

STAPEDIAL REPOSITIONING

The fenestration of the oval window with the surgical burr is indicated in thick, footplate otosclerosis. This total, or near total, fenestration of the oval window requires the vein graft, the vein plug, or some viable tissue to seal the oval window niche.

The classical fenestration of the oval window with the vein graft is to be differentiated from the subtotal fenestration of the footplate using the gelfoam (absorbable) stopple, as advocated by House.[12] This subtotal fenestration of the footplate is indicated when there is thin otosclerotic invasion of the footplate. In such a case, the footplate may be fragmented with the pick or chisel and a few fragments of the footplate removed with less disturbance of the labyrinth.

The fenestration of the oval window and the subtotal fenestration of the footplate are *not* indicated when there is a useful area of normal footplate and when a bypass operation may give a worthwhile and lasting hearing improvement without postoperative serous labyrinthitis or the danger of the occasional delayed end organ nerve deafness.

Fenestration of the oval window and vein graft have been performed in 26 of the last one hundred stapes operations. Of these, seven were for advanced primary otosclerosis, fifteen were secondary operations for advanced primary otosclerosis following failure of an earlier operation. Round window closure was present in two patients, and two others were fenestration failures; these four operations were worthless.

LABYRINTHINE DISTURBANCE

Postoperative serous labyrinthitis has been discussed by Dr. Shambaugh.[25]

Delayed end organ nerve deafness is being reported with increasing frequency following various types of fenestration of the oval window. These patients have an initial good result following the fenestration of the oval window. About four to eight weeks postoperatively, they develop recruitment and an end organ nerve deafness. With this end

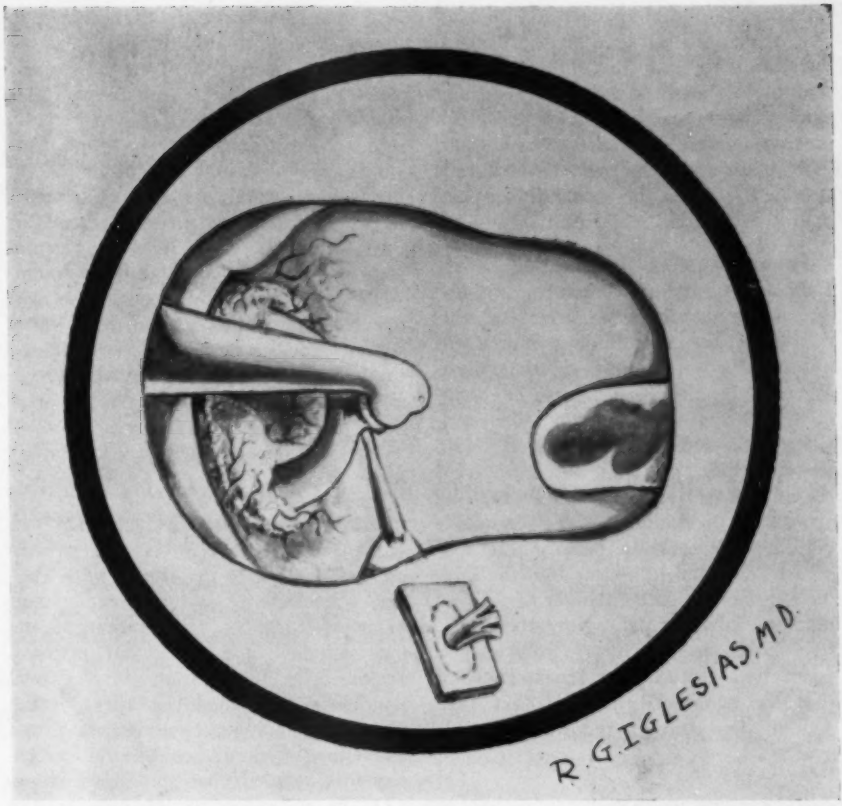

FIG. 5—Fenestration of the oval window with the surgical burr is indicated in thick footplate otosclerosis. In this total, or near total, fenestration of the oval window, a vein graft or some viable tissue to seal the oval window niche is required.

organ deafness, there is the characteristic near-complete loss of speech discrimination and the patient has a worthless ear. To date, this delayed destruction of useful hearing has not been adequately explained. I regard this as a "mucous or chemical labyrinthitis," reasoning that if a single middle ear mucosal cell is left under the vein graft and folded into the inner ear, that mucosal cell will continue to secrete into the inner ear, into the perilabyrinthine space, and the patient develops the characteristic end organ deafness—a perilabyrinthine hydrops.

Mucous labyrinthitis with the ultimate rapid onset of end organ deafness may become a surgical emergency. To date, all such cases have been treated expectantly with no recoveries and the final loss of useful hearing. The next such case which I encounter I plan to treat as a surgical emergency with removal of the vein graft, searching for mucus in the inner ear, then inserting a gelfoam stopple and a stainless steel stapes. Schuknecht[22] reports such an ultimate end organ deafness in about 2 per cent of patients and others indicate a similar incidence of secondary worthless ears.

When the otosclerosis is so extensive that it must be removed with a surgical burr, then the margin of the oval window niche should be thoroughly enchondralized with the removal of every microscopic shred of mucous membrane. The removal of this mucous membrane is done to prevent the possibility of postoperative mucous labyrinthitis.

House's subtotal fenestration of the footplate is employed when there is less extensive pathologic change. In this technique, the surrounding mucosa is not disturbed, for it may stimulate bleeding into the inner ear. House has demonstrated that these subtotal fenestrations of the footplate may be sealed with the convenient gelfoam, and I know of no delayed end organ deafness resulting from this technique. The absorbable gelfoam theoretically permits the mucosa to continue to secrete into the middle ear and avoids the danger of delayed mucous labyrinthitis. Nevertheless, I have never been willing to rely on gelfoam to seal the total fenestration of the oval window, and feel that such a total fenestration requires a viable graft.

The Prosthesis

Shea and House routinely employ a polyethylene strut to reconstruct a stapes. Schuknecht[21] and Kos[15] utilize stainless steel. Portmann[17] advocates replacing the stapes over the vein graft as originally described by Shea. When possible, I try to preserve the posterior stapedial crus attached either to the incus or the stapedius tendon and replace it over the vein graft. When the stapes cannot be preserved, I prefer to use a stainless steel stapes and the vein plug stapedioplasty of Kos.

SURGICAL JUDGMENT

Surgical judgment was taboo in 1957 (Farrior[4]), for at that time the ear surgeon was almost legally required to attempt some form of blind total stapes mobilization before his confreres would sanction the use of the reliable and predictable fenestration of the horizontal semicircular canal. These blind total stapes mobilizations or attempts at these blind total stapes mobilizations were advocated even in the presence of thick footplate otosclerosis, bicrural otosclerosis, extensive footplate extensions and anterior crural otosclerosis, which pathologic circumstances are now well accepted to be beyond the limits of total mobilization surgery. Excessive manipulative stapes surgery in the presence of this extensive disease process has produced permanent injury to many inner ears.

Surgical judgment is again taboo in 1959. The ear surgeon is now advised on good authority to proceed with routine stapedectomy and the employment of some form of fenestration of the oval window and insert an artificial stapes. The fenestration of the oval window is advocated regardless of the existing pathologic circumstances; this conveniently eliminates (1) all necessity for knowledge of stapes pathology, (2) the necessity for training in the microscopically more accurate bypass surgery, (3) disturbances in surgical routine, and (4) the necessity for surgical judgment.

In contrast to these purely technical approaches to a complex stapes problem, I feel that the stapes surgeon should be permitted to employ surgical judgment. I advocate that the stapes surgeon first be fully trained in the diagnostic interpretation of the multiple variables in the pathology of otosclerosis, and having made a microscopically accurate pathologic diagnosis, the stapes surgeon then be fully prepared to proceed with the microscopically appropriate, individualized surgical technique which utilizes the

uninvolved portion of the stapes with the greatest chance for successful restoration of hearing and with the least chance of injury to the inner ear. To obtain maximum restoration of hearing with minimal damage requires profound surgical judgment.

SUMMARY

1. Shea has made a great contribution to otology in his basic concept of fenestration of the oval window and the removal of the otosclerosis; it is indicated when the otosclerosis needs to be removed.

2. Total mobilization of the stapes (direct or indirect) has given more hearing to more patients than any other technique because of the universal employment of this basic technique.

3. Total mobilization of the stapes has been disappointing, however, because of the high percentage of refixation and limited pathologic adaptability.

4. A high percentage of good and lasting results may be achieved by working around, rather than through, the otosclerosis and utilizing normal portions of the stapes; this is bypass surgery.

5. The bypass operations are anterior crurotomy, crural repositioning, and artificial recruralization; their specific pathologic indications are presented.

6. Otologists motivated by mechanical manipulations totalized in total mobilization, met with disappointment, and, therefore, jumped directly to the vein graft, bypassing bypass surgery; yet, bypass surgery is not passé, as is indicated by the high percentage of good and lasting results when the otosclerosis is bypassed.

7. Bypass surgery is indicated in anterior footplate otosclerosis, anterior crural otosclerosis, marginal otosclerosis, and bicrural otosclerosis as long as there is a useful area of normal footplate.

8. The subtotal fenestration of the footplate (House) is indicated in thin footplate otosclerosis.

9. The total fenestration of the oval window is indicated in thick footplate otosclerosis and obliterative otosclerosis.

10. Stapedial repositioning (transposition) is, where applicable, preferred to artificial crura.

11. The Shea stapedectomy and vein graft is a great contribution to surgery for deafness, but it does produce significant immediate and delayed labyrinthine disturbance.

12. The immediate and delayed labyrinthine disturbance is less in bypass surgery.

13. The fenestration of the oval window and the vein graft or the vein plug stapedioplasty are indicated only in pathologic circumstances which will not respond to bypass surgery.

14. The complexity of stapes pathology cannot be simplified to a single technical approach, but requires highly developed pathologic knowledge and many surgical skills.

15. The following classifications of stapes pathology are submitted with the pathologically appropriate technique:

16. *Summary for Patients:* In deafness from otosclerosis when the otosclerotic growth of bone is small, the operation is performed on the stapes itself. In larger growths of otosclerotic bone, all or any part of the stapes may be removed and replaced by gelfoam, a vein graft, stainless steel, or polyethylene tube, to ensure lasting hearing improvement.

SURGICAL PATHOLOGY	APPROPRIATE OPERATION
I. Anterior Otosclerosis	Anterior Crurotomy
II. Minimal Anterior Otosclerosis	Attempt Crurotomy (Compromise with total mobilization in small lesions)
III. Bicrural Otosclerosis Wide Niche Normal Footplate	Crural Repositioning
IV. Bicrural Otosclerosis Narrow Niche Normal Footplate	Artificial Crus Footplate Mobilization
V. Bicrural Otosclerosis Footplate Invasion	Artificial Crus Subtotal Footplate Fenestration
VI. Thick Footplate Otosclerosis	Fenestration of Oval Window and Vein Graft or Vein Plug
VII. Obliterative Otosclerosis	Fenestration of Horizontal Canal

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DISCUSSION

FRANZ ALTMANN, M.D., New York: I fully agree with conclusions so ably presented in Dr. Farrior's paper. I feel that with the operating microscope under 16, or even 25, times magnification, we will be able, in the majority of cases, to recognize the parts of the footplate which have remained free from otosclerosis. There is only one minor point I want to bring up. I do not think that the mobilized footplate should be impacted. My own histologic findings and those of Lindsay in postoperative cases indicate that healed tears in the annular ligament are areas of predilection for hyalinization, calcium deposits and subsequent new formation of bone which might lead to reankylosis of the footplate. This fact should always be remembered during mobilization operations. Even in cases of thin anterior otosclerosis with a narrow bridge of inactive otosclerotic bone extending into the anterior margin of the footplate, the mobilization attempts should be confined to breaking the bony bridge, with careful avoidance of any tears in the annular ligament.

The impressive results achieved with removal of the stapedial footplate or of the whole stapes with reconstruction of the sound-conducting mechanism through a tissue graft alone or together with a prosthesis raise the question whether one should even try anterior crurotomy, crural repositioning or artificial cruralization. If cautious indirect mobilization fails, should we not rather routinely remove the stapes, or at least the stapedial footplate? Such a *modus procedendi* could be very tempting because it would transform the somewhat unpredictable stapes mobilization operation into a standardized procedure like the fenestration operation. It would also eliminate the necessity of revisions if reankylosis should occur after one of the other procedures. However, I sometimes wonder if we are not too much concerned with the large percentage of cases in which reankylosis occurs and too little with the relatively large number of cases in which the footplate remains mobile for many years. Furthermore, if a tissue graft were used, it remains to be seen whether the otosclerotic bone of the window frame, "activated" by the operative trauma, would not also grow into the tissue graft and again produce eventually, although perhaps much later, an ankylosis of the new footplate.

It is to be hoped, that artificial prostheses will be tolerated indefinitely by the tissues of the human middle ear; it is by no means certain, although experiments on cats, performed by Schuknecht, have so far shown very promising results. Even the possibility of a carcinogenetic effect of these substances in rodents has been brought up, although so far there is not the slightest indication of it in man.

Only observation over a long period of time will tell whether any of these events will actually take place. At the present time it seems to us advisable to adhere strictly to Dr. Farrior's thesis that there are pathologic indications specific for each of the types of operations upon the stapes, the oval window, and the ampulla of the lateral semicircular canal.

ARTHUR L. JUERS, M.D., Louisville, Kentucky: My philosophy of stapes surgery has, for the most part, corresponded to that presented by Dr. Farrior. While utter confusion seems to exist concerning technique, some common trends in thinking are crystallizing.

The desirability of bypassing the lesion is no longer questioned. This conclusion is based on clinical experience and has been substantiated by histologic studies presented by Altmann and Lindsay. However, there is still diversity of opinion concerning the management of extensive otosclerotic lesions. I will not comment on this specifically.

I agree with Dr. Farrior concerning the use of crurotomy and crural transposition. This is easy for me to do, since we simultaneously and independently conceived of the utility of crural transposition in certain situations.

I should like to relate briefly my own experience with this technique. I presented my method of accomplishing this in March at Dr. Shambaugh's workshop, and I should like to make a brief comment on what has happened to the cases I presented at that time. I have made a few modifications in the technique. If the lesion is limited to the anterior footplate, I start with an anterior crurotomy. I purposely try to avoid total footplate mobilization through the lesion. In the process of doing the crurotomy I am able to determine whether or not there is any mobility of the posterior area of the footplate. If there is slight mobility, then I attempt to carry out Fowler's procedure. If the posterior footplate shows no visible evidence of motion, then I use the posterior crural transposition technique.

[Slide] The first slide shows the crurotomy. A description of this technique will be published in *Laryngoscope*, in case anyone wants to follow the details. The posterior crus is cut along here. The crus is resected anteriorly, and the footplate is fragmented. The cracking shown is of an idealistic eggshell type. Actually it is impossible to do it that minutely. Usually you have two or three fragments, and occasionally a definite dehiscence will occur.

[Slide] The posterior crus is positioned, and this frequently poses a problem. The crus is frequently just a little short of the footplate. The gap can be filled in with a little piece of bone. When an opening or dehiscence is created larger than desired, I put a piece of soft tissue over the opening and the crus over that, as Portmann originally suggested, and this completes the usual transposition technique.

Another technique is to make the window in the footplate purposely and place the crus directly over it, placing some gelfoam around it to seal the perilymph space.

[Slide] This is the chart I showed in the spring. The first cases listed are the first ten transpositions I did. For the most part, the hearing of the patients showed a very excellent gain. Since then, cases 2 and 4 have regressed almost completely to the preoperative level. In reviewing my operative notes, I find that in these cases the bluish footplate was relatively thick. In the other seven cases, hearing regressed about 5 or 10 decibels in the first month or two and has since been maintained at that level. In case 10, I made an opening in the footplate and placed the crus over it, but I didn't quite get a closure. However, this is the only case of the group that has maintained the best level at 25 decibels.

[Slide] The posterior third of the footplate was removed in this case, and the crus is dangling in the opening. It is always just a little short. The perilymph space is sealed off with some soft tissue. As you can see, the low tones came up quite well, and on the six-week postoperative audiogram there is a considerable drop in high tone bone conduction and air conduction as well. This illustrates the point that Dr. Shambaugh mentioned. If we are going to do statistical studies and also know five years from now what happened to the labyrinth one week postoperatively, I think it is important to do air audiograms and perhaps bone conduction audiograms one week after the operation. At four weeks, in the upper right, there has been moderate recovery of the high tone frequencies.

That newly coined word under the upper left audiogram is "acoustalgia," which means discomfort in response to ordinary sound. This patient works in an office and ordinary office sounds are unpleasant to her. Whether this represents an inner ear situation or is due to the change in the mechanics, the lack of limitation of motion—in other words, an excessively mobile crus with no tissue underneath it—I don't know. I see this occasionally. I have seen a few patients in whom vein grafts done by others have resulted in similar symptoms even several months postoperatively. They cannot listen to television with comfort. So I think that we need to consider whether we are overmobilizing.

[Slide] I feel a little more satisfied with this technique, which consists in removing the posterior part of the footplate when the lesion is in the anterior part, and plugging the opening with some soft tissue. I used a small piece of perichondrium here. I have followed this technique several times recently and results have been most satisfactory. There is very little labyrinthine reaction. These people go home the day after the operation. They have relatively little vertigo which lasts, as a rule, not more than three or four hours. I think this is another way of utilizing the structures that are there for reconstructing a useful level of hearing.

I should like to have Dr. Farrior comment on one problem. In view of the possibility of an ultimate drop in cochlear function, what interval should we allow before operating on the second ear? I know that Dr. Shea now says one year. I certainly think that is a wise trend.

Another question for Dr. Farrior is, "How do you think surgical trauma to the lesion will affect the otosclerotic activity. Will it increase it?" It certainly has been my impression in revisions that the bony structures and mucous membrane look much more hyperemic than they did originally.

Bellucci has observed in laboratory experiments that trauma to the oval window margin stimulates osteogenesis. If the same reaction occurs in man, will total footplate extirpation and extensive trauma to the entire mucoperiosteum of the oval window recess initiate and invite eventual osteogenetic obliteration of the recess? Should we, when anatomy and pathology permit, avoid removing the footplate rim and create a large opening only in the center, somewhat like that in the last case I reported?

Lastly, I think that we might ask ourselves this question: What price should the patient pay for the still uncertain chance of permanent hearing improvement—not the surgical fee but the price in terms of immediate or delayed severe cochlear damage, the frustration of regression of improvement, and persistent vertigo and, in rare instances, facial paralysis? Is there a different price for cases with minimal disease as compared to the price for those with extensive lesions? Experience to date suggests that the price is higher in extensive lesions. At what point in the extension of pathologic change will the price be too high?

Only time, further experience, and discussions such as we have had today can provide the answer.

VESTIBULAR SUPPRESSION IN FIGURE SKATERS

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IT is possible for man to learn to ignore normal responses from his vestibular labyrinth. Many thought that ballet dancers might do this in dancing a pirouette (which is a continuous spinning step) across the stage, enabling them to unaccountably stop suddenly and hold a graceful pose, without any evidence of postrotatory disorientation or nystagmus. But any ballet dancer can state how this is done: by "spotting." The dancer fixes visually upon a conveniently prominent landmark, and allows her body to turn under her until she can no longer "hold" this landmark. Then, with her body still turning, the head undergoes a sudden rapid rotation until the original landmark can again be fixed upon. This description is in any ballet primer.

There is no physiologic change brought about in the dancer's labyrinth. Tschiassny,[3] three years ago, clearly demonstrated this by the simple expedient of blindfolding a ballet dancer. Then normal postrotatory nystagmus and past-pointing were evidenced. He cited Dohlman in explanation of this: "There is no cupular displacement on brief, rapid rotation of the head, because acceleration when rotation starts and deceleration when rotation stops are opposing forces, tending to neutralize one another when appearing within a brief interval."

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It occurred to us that figure skaters spin at a much more rapid rate, yet they escape all the sequelae of prolonged rotation with equal ease. To determine whether they "spotted" fractionally, or perhaps with their eyes alone, or used any other discernible trick to avoid postrotatory vertigo, a cinematographic study was carried out.

PROCEDURE

The services of two highly proficient figure skaters were obtained: one, a thrice world champion amateur figure skater, and the other, a professional show skater for ten years. On the ice, motion picture films of rapid spins were made at the regular 16 frames per second (fps) and also at 400 fps. If the skaters spotted with the head or fractionally with the eyes, it could be detected by viewing the high speed film at the regular 16 fps. If their rotational speed is 4 rotations per second (rps), in the regular speed film a picture would be taken every 90 degrees of rotation, but in the high speed film, one would be taken every 3.6 degrees of rotation. This, in effect, slows the speed down twenty-five times. Again on the ice, films were made of the subjects doing spins stimulating selective pairs of semicircular canals, i.e., both horizontal canals, the right posterior and left superior canals, and so on. In the Bárány chair close observation for postrotational nystagmus was made after adequate stimulation. Bárány spins were filmed with and without blindfolds, observing for nystagmus and staggering on im-

mediate tape-walking. These tests are all considered nonmaximal vestibular stimuli. To provide a maximal stimulus, the caloric test using 20 cc. of ice water was used, the stream of water playing directly on the posteroinferior quadrant of the tympanic membrane for twenty seconds. The posterior semicircular canals were tested in unison, and the horizontal canal separately.

RESULTS

Rotational speeds of 4 per second were regularly attained by the subjects for up to ten seconds. Speeds of 5 rps were attained at times. After each spin, the subject was able to stop suddenly, holding a graceful pose for as long as required. Postrotational nystagmus was absent. This applied whether the horizontal or vertical canals were stimulated (fig. 1). This was borne out more clearly in the Bárány spins, where closer scrutiny was possible. Slow-motion photography provided the examiner five seconds to examine one rotation. The head turned with the body at all times, the eyes were half closed, the gaze slightly upward. No attempt to spot with the head or fractionally with the eyes was detectible. Visual fixations of any kind were absent; instead, wandering, autogenous eye movements were at times present.

Subjects were able to tape-walk after a Bárány spin, equally well whether blindfolded or not. Nystagmus was absent whether blindfolded or not. Perhaps the most surprising effect of all was the response to the caloric test using 20 cc. of ice water. Neither vertigo nor nystagmus could be elicited by stimulation of the vertical or horizontal canals.

DISCUSSION

To observe the course of development of the above phenomenon, three young beginning figure skaters were trained by a professional over a 5-month period to a certain adeptness in the art of spinning on ice. At the beginning, all had normal responses to caloric and Bárány testing. By the end of the season, all had markedly diminished but not completely absent responses to the tests employed. It is debatable whether residual vestibular activity prevented their ability to spin faster and better at this point, or whether their natural athletic capacities prevented faster and more prolonged spinning, thus producing further diminution of response. Further experimentation is under way to determine this point. The canals whose axes are the same as the axis of rotation are first to decrease in response. In the newly trained subjects, the decline in the response of the horizontal canal was greater than that of either posterior

FIG. 1—The absence of visible postrotatory sequelae applied whether the vertical or the horizontal canals were stimulated. (Scene from the film)

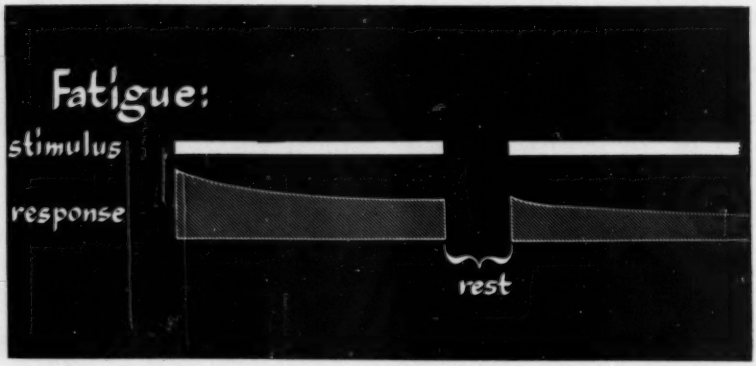

FIG. 2—Loss of response due to fatigue shows definite signs of recovery after a short rest period.

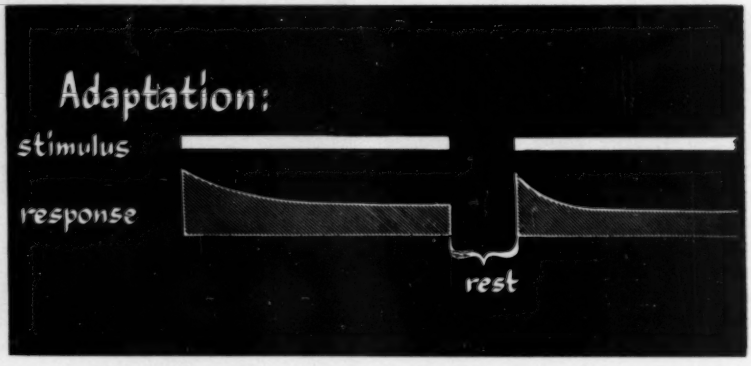

FIG. 3—In adaptation, the loss of response shows full recovery after a short rest period.

canal, in which responses were nearly normal. It is likely that posterior canal response will steadily diminish. In the two original subjects, the effects of repeated stimulation primarily to the horizontal canals were eventually distributed to all canals.

It is also likely that these effects are reversible. After any prolonged layoff, even a few weeks, the first two subjects noted moderate dizziness on rapid rotation, which disappeared in a few days if spins were continuously performed.

Three neurophysiologic mechanisms may explain the demonstrated response decline. These are fatigue, adaptation, and central suppression.

Fatigue is neural in origin, occurring in the vestibular nerve or vestibular nuclei, and is due to an accumulation of chemical mediator causing block at the point of synaptic transmission. The loss of response here, after a very short rest period, shows definite signs of recovery (fig. 2). In a matter of minutes or hours, complete recovery occurs.

Adaptation occurs probably in the hair cell itself. After a short rest period, complete recovery from adaptation takes place (fig. 3). Furthermore, the adapting elements of the cupula show a directional specificity; that is to say, prolonged cupula deflection in one direction diminishes its subsequent response to deflections in the same, but not in the opposite, direction. In the three skaters who received training, response decline was accomplished almost exclusively by rotation in a clockwise direction, while loss of response to both clockwise and counterclockwise stimulation was evidenced in the final tests.

(*Habituation* is a generic term which gained currency in the old literature, applying in psychology to the loss of response to repeated sensory stimuli, whatever the cause. It is hence a nonspecific term supplying no information as to the physiologic mechanism. Its use today seems best restricted to those drugs which produce somatic or psychic dependence, particularly those producing withdrawal symptoms.)

Central suppression seems the most likely mechanism to describe the phenomenon we see here. In this process, recovery after response decline, following a short rest period, is negligible (fig. 4). This suppression is first over the cupulae, stimulating the suppression, but then spreads to involve the entire vestibular labyrinth and, hence, must involve higher neuron arcs in the process. We know at least some of the central connections which produce inhibition of the vestibular nuclei: The cerebellar cortex, for example, has a direct inhibitory influence over the nucleus fastigius, which is itself booster to the lateral vestibular nucleus of the same side but an inhibitor of that of the opposite side (fig. 5). Through the corticopontocerebellar tracts, the cerebral cortex participates in this regulatory action.

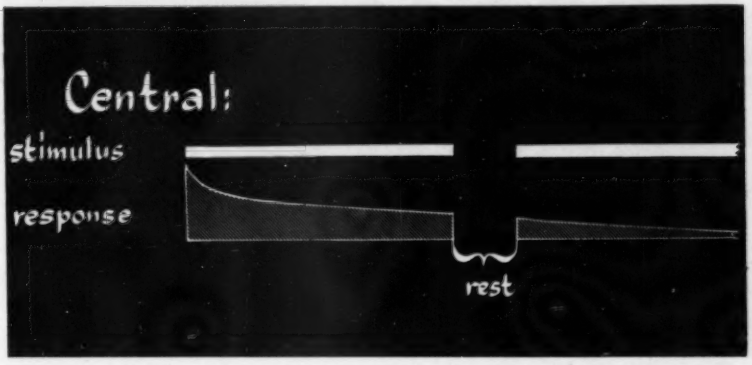

FIG. 4—The loss of response due to central suppression shows no recovery after a short rest period.

It is possible, then, to attain complete vestibular suppression by a physiologic means. So far as I know, this is the first recorded instance of complete vestibular suppression in otherwise normal, healthy people. This evidently has been an active, intended suppression. We know that in both Ménière's dis-

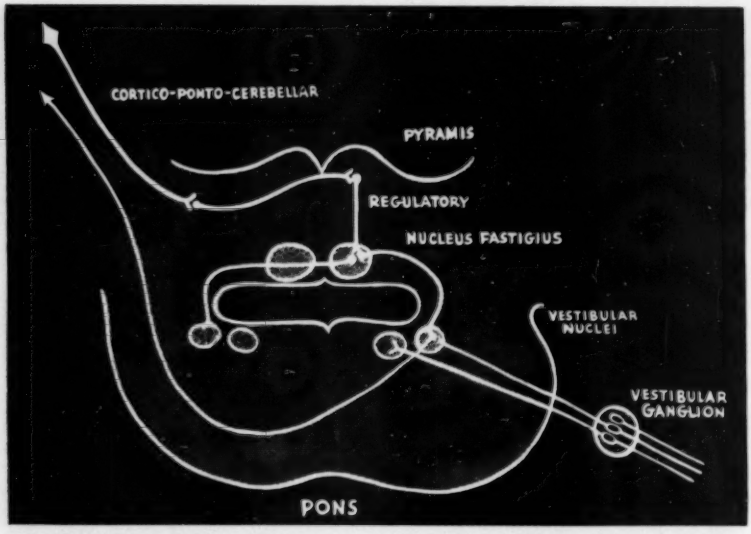

FIG. 5—We know of some of the brain tracts operative in producing central suppression from vestibular centers. (after Cranmer)

ease and motion sickness, the most distressing symptoms are mediated through the vestibular apparatus. Although the psychogenic component probably is great in both these diseases, whether this is cause or effect is debatable. It would seem, however, that particularly in motion sickness, a method of central suppression would be a more physiologic and, hence, a more desirable method of management than is presently available.

It is our intention to extend present research into this phenomenon, studying the development of suppression in normal and in pathologic ears. Further experimentation must await the construction of a high-speed rotating platform with speeds approaching 300 rotations per minute, to approach those rates producing suppression in the above subjects.

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HEARING TESTING ON THE VERY YOUNG CHILD

Follow-up Report on Testing the Hearing of 968 Preschool Patients with the Pediacoumeter

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THE differential diagnosis of speech delay and the accurate assessment of hearing loss in the very young child continues to be among the most challenging problems facing the ear, nose and throat physician or hearing clinic today. This is particularly true since the success of language and speech development is largely dependent on the early commencement of appropriate training procedures following such diagnosis. Several years ago we[1] described the development of a solenoid-released jack-in-the-box device, the Pediacoumeter, to be used as accessory equipment to the audiometer in measuring the pure tone thresholds of the very young child aged from 2 through 5 years. It was our feeling then, and our very firm conviction now, after Pediacoumeter hearing tests on nearly 1,000 ear, nose, throat, and delayed speech patients since that time, that before an accurate evaluation or diagnosis of hearing impairment can be made, before a differential diagnosis of speech delay expected, or before a prescription made for amplification or educational needs, the child must be tested for his threshold of hearing pure tones. The physician or audiologist is often forced, however, to delay such testing until a child has reached the age of 5 or 6, for it is virtually impossible, with conventional audiometric techniques, to obtain an accurate evaluation of the hearing in a very young child. The listening situation is meaningless to him; he does not understand what is expected of him; his short attention span makes it impossible for him to attend consistently and for adequate lengths of time; and he has no motivation for listening to the very faint threshold sounds. In order that such an evaluation may be accomplished satisfactorily on a young child from 20 to 60 months, and on the slightly older child with short attention span, it is necessary to have a device which will capture and hold his interest for the listening situation. Such a device must also motivate him to *want* to attend to the very faint threshold sounds. The reward of seeing the funny painted dolls of the Pediacoumeter and the surprise element of their popping up has accomplished this where conventional audiometry has failed.

The Pediacoumeter consists of a small case in which are mounted seven doll heads. These doll heads are fastened to shafts from seven solenoids providing the driving force for the release of the figures up and out of their houses when the pushbutton switch is closed by the child, as he hears the audiometric pure tones. A separate switch is provided in the line to prevent random completion of the circuit by the child when the audiometer tones are not presented.

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Before the Pediacoumeter is employed, some preliminary adjustment of the patient to the testing situation and observation of his behavior is indicated. Most very young children on being ushered into the soundproof rooms have a certain amount of apprehension, and may vigorously resist the hearing testing procedure if approached too rapidly. It is wise to let the child move about freely for some time, investigating the room and playing with a few toys. During this time he begins to feel more comfortable and the tester has an opportunity to observe his general behavior and his motor control, curiosity, use of visual cues, language and speech, and his gross response to sound. During this time one can measure his cessation of activity or searching responses to roughly calibrated noisemakers or sound effects presented through the freefield speaker setup. A thorough history and otologic examination should already have been done at this point. If the child is severely delayed in speech and language development, some sort of behavioral inventory profile for the differential diagnosis of deafness, mental retardation, aphasia, and emotional disturbance should also be plotted during this time from information obtained by observation of the child and interviews with the parent.

When the child is happy with the environment, the next task is to get him to accept the earphone headset. A miniature headset of small rubber cups glued to an old bone conduction head band, to which is attached a hearing aid cord, can be very useful. A boy or girl doll is given to the child, the headset is placed on the doll and the cord "plugged" into the wall. Several large pictures of small children with earphones, "playing the game," to which reference can be made, are also helpful. Then an additional headset for the parent usually convinces the child that he has nothing to fear from the phones.

If the child has speech understanding and will accept the phones at this point, a speech reception threshold may be obtained as an indication of the approximate range where pure tone probing should begin, and also as confirmation of the pure tone average thresholds later recorded. The child is asked to "point to" or "pick up" or "give to Mommy" common, familiar toy objects which are represented in his vocabulary. The intensity of the voiced requests is gradually attenuated until the lowest level at which three instructions can be correctly carried out is reached, and this is taken to be his speech reception threshold.

The results of our tests on 968 preschool patients using the Pediacoumeter, since the time of the original report in 1951, is shown in table I. It is broken down into age groups from one year through five, and shows the number of successful and unsuccessful tests with percentages for each group and for the total series. By successful testing is meant the plotting of what was felt to be a reliable pure tone air conduction or AC and BC threshold audiogram, on a patient whose responses were consistently present immediately above threshold, present at least two out of three times at threshold, and consistently absent immediately below threshold. Figure 1 shows that we have been 96 per cent successful with the 5-year-old (287 out of 298), and 94 per cent successful in testing the 4-year-old (272 out of 287). In testing the 3-year-olds we have had a percentage of success of 82 per cent, or 187 out of 227. There were 62 successful tests on 2-year-olds for a percentage of success of 47. On the 1-year-olds we had only three successes—one child 21 months old and two who were 22 months old—for a percentage of 12.

TABLE I

PEDIACOUMETER RESULTS
1952-1959

RESULT	AGE GROUP					TOTALS
	5 TO 5-11	4 TO 4-11	3 TO 3-11	2 TO 2-11	1 TO 1-11	
Successful. Complete pure tone audios	287	272	187	62	3	811
Unsuccessful. No conditioning. Phones tolerated	7	9	21	41	12	90
Unsuccessful. No cooperation with earphones	4	6	19	28	10	67
Totals	298	287	227	131	25	968
% successful tests	96	94	82	47	12	83

The small number of total cases in the 1-year group is due to the fact that on many infants no attempt is made to use the Pediacoumeter if it is certain that it can have no application, and reliance is placed on noisemakers and sound effects. Also poor response to sound or delay in speech is often not recognized or investigated by the parents until about the second birthday. The totals show 811 successful tests, 90 unsuccessful where conditioning to testing with pure tones was not possible, 67 additionally unsuccessful because of lack of cooperation with the earphone headset or one earphone held to the ear, out of a total preschool population of 968. This represents a total percentage of success of 83, with 17 per cent unsuccessful. The Pediacoumeter has been used advantageously on many children 6 and over who had had brain injuries, were mentally retarded or otherwise severely handicapped in language areas and attention span, but these were not included in this study of preschool youngsters.

In place of describing the use of the Pediacoumeter, I would like at this time to present a short film which demonstrates the technique of testing—in this case on a child two years and one month old.

[Motion picture was shown.]

In conclusion, it has been pointed out that early diagnosis and assessment of hearing impairment is imperative, and that conventional audiometric techniques do not suffice in testing the very young child. In addition, it has been suggested that an interesting, appealing attention-holding device which will motivate the young child to want to attend to the very faint threshold sounds is essential for successful pure tone testing. The results, which have been described, on 968 very young preschoolers indicates that the Pediacoumeter has proved to be highly successful in testing this very difficult age group.

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A QUASI-INTEGRATED BURIED MUSCLE CONE IMPLANT WITH GOOD MOTILITY AND ADVANTAGES FOR PROSTHETIC FITTING

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WE are told that many ophthalmic surgeons are reluctant to use any motility implant more complex in form than the simple plastic, glass, or metallic ball. One reason given is the surgeon's geographic isolation from eye fitters who have the special knowledge required for properly fitting each type of implant. This problem provided strong motivation for the recent organization of eye fitters into professional associations. Their objectives include ready exchange of information and thorough training of students of ocular prosthetics. We believe these organizations will be successful. Therefore, we feel that this is an appropriate time to present a new buried motility implant and the surgical procedures essential to its success.

With this implant, we have accomplished a keying of the prosthesis and implant through a complex of form relationships. This has been possible despite the fact that the implant is completely buried — thus the term *quasi-integrated*. Beyond the obvious purposes of replacing volume and transmitting immediate and adequate motility to the prosthesis, the aims of this implant extend to the field of prosthetic fitting. The problems of sagging of the lower lid, inferior displacement of the prosthesis, invagination of the upper lid, and cyclic rotations of the prosthesis are reduced to relative insignificance. While persons of all age groups benefit, several of the advantages are especially notable in elderly persons in whom lack of tissue tonus is more common. When such persons with the new implant are fitted with prostheses based upon correctly made alginate impressions, the prostheses are supported to fill all spaces well. In our experience to date, this has resulted in healthier sockets, requiring little attention from the patients or their physicians.

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CLASSIFICATION AND HISTORICAL BACKGROUND

It is not the purpose of this paper to discuss the history of evisceration and enucleation, nor is it our purpose to compare all types of implants. Evisceration and enucleation can be generally classified by the shape or other special physical quality of the implant and its method of implantation. The following is a simple classification:

I. Evisceration

A. Simple

B. Buried intrascleral implant
   1. Spherical implant
   2. Nonspherical implant

C. Semiburied (integrated) intrascleral implant

II. Enucleation

A. Simple

B. Buried muscle cone implant
   1. Spherical implant
   2. Nonspherical (quasi-integrated) implant
   3. Magnetic (semi-integrated) implant

C. Semiburied (integrated) implant

The subject of this paper, the Iowa implant, is a nonspherical (quasi-integrated) buried muscle cone implant. Only this type is considered in the following discussion.

Wheeler[7] was one of the first to modify the classical sphere implant by adding grooves to receive the rectus muscles. The purpose was not to increase motility beyond that with the true sphere but to prevent migration of the implant and deepening of the upper lid fold. This implant was placed secondarily after a simple enucleation.

A number of implants have been devised which make provision for the attachment of muscles and cause more instantaneous motility by means of a flat, or a nearly flat, anterior surface. One of the more highly developed of those was that of Allen and Allen.[1] The Hymes[5] implant also has a flat anterior surface. In that it has grooves for the muscles, it resembles the Iowa implant. However, since there are no rounded mounds on its anterior surface, it cannot by intent or by coincidence be depended upon to support the prosthesis or to prevent cyclic rotation of the prosthesis.

A few other buried implants, aside from true spheres, have been designed to present other than flat surfaces toward the artificial eyes. Several, including some variations of the Allen implant, give a slightly curved or even a full rounded surface to which the prosthesis is fitted. These have been advocated for the sake of easier fitting. Snellen reform eye shapes, including stock eyes, are usually used with little alteration in such sockets. While some sockets so equipped provide good motility, in the average case the result is not as good as with implants with other types of anterior surfaces. In our opinion, the most important reason for this is that the hollow Snellen type of prosthesis over a curved implant resembles a ball-and-socket joint, which is used specifically to allow for the very type of slippage to be avoided in the case of implants.

In one of the attempts to avoid such slippage, Dimitry[4] advocated a semisphere topped by a prism. The semisphere was set posteriorly, and the prism forward. The apex of the prism ran in the vertical meridian, and Tenon's capsule and conjunctiva were closed along it. Unfortunately, with the artificial eyes available at the time of its presentation, no movement occurred. This implant, presumably, also failed to support the prosthesis.

Two implants have offered better motility and support of the prosthesis. Both, however, make no provision for the prevention of cyclic rotation. They are the basket implant of Cutler[3] and that of Culler.[2] The latter has for its anterior surface a rounded cylinder covered with tantalum mesh. This cylinder is affixed to a modified sphere. Cutler, in describing his basket implant, has set forth very simply and clearly its rationale, which coincides with our own:

> It is a common observation that whether an evisceration or an enucleation with im-

plantation has been done there is a fairly good movement of the stump. This is true whether the rectus muscles have been sutured together or not. In fact, often surprisingly good movement in the socket is obtained with a simple enucleation. The problem has been to transmit the movement to the prosthesis. Its solution has been aided by the recent development of molded plastic artificial eyes, which give a better contact with the socket, resulting in increased movement. . . .

The purpose of a basket implant, with a resulting depressed area in the socket, is to give the prosthesis, which has a stud projecting posteriorly, a grip on the stump. . . .

FIG. 1—Implant (right) showing the four mounds, hole (a-a) through medial base of mounds for fibrous tissue invasion, holes (b) for reception of insertion clips and fibrous tissue fixation, conformer, (c) showing posterior surface with the four depressions.

I have seen two cases in which a ball implant was placed in the sclera with extremely good movements, practically as good as that of the normal eye; but because of the smooth contour, only a small amount could be transmitted to the prosthesis.

Many enucleation procedures and implants have been devised to insure action of the ocular muscles, by suturing them in front of the prosthesis or to the prosthesis itself. It is my opinion, as previously stated, that the problem of motion of the prosthesis does not lie in this solution.

THE IMPLANT, THE CONFORMER, AND THEIR RATIONALE

The Iowa implant (fig. 1) at present is constructed of clear acrylic plastic.* There is reason to believe that the implant can be made of other materials. The back of the implant is a hemisphere, with a radius of 21 mm., having on its forward surface four rounded mounds. The over-all anterior-posterior dimension of the implant is 15 mm. and the height of the mounds is 5 mm. The grooves between the mounds are 4.5 mm. wide at the base of the mounds and 5 mm. wide near the apex of the mounds. These grooves are depressed centrally to allow for the thickness of the imbricated muscles. The centers of two adjacent mounds are 9.75 mm. apart. The outside dimension of two adjacent mounds is 19.5 mm., and the outside dimension of two diagonally opposing mounds is 21 mm. A communicating hole (fig. 1, a-a) passes through the central base of each mound. These were originally designed for sutures, but sutures attaching to the implant were found unnecessary. These holes are now left in the implant so that fibrous tissue will grow into them, affecting a firm union between implant and muscles. Two holes drilled in the form of a "V" (fig. 1, b) are present at the peripheral base of each mound. These holes are for the insertion of the cross-action stainless steel clips (fig. 2, a) which form a jig for

*Manufactured by Precision-Cosmet Company, Inc., 529 S. Seventh St., Minneapolis 15.

placement of the implant. The construction of the clips and holes allows the clips to disengage easily when compressed at points indicated at d in figure 2. The volume of the implant is 3 cc. The comformer (figs. 1 and 2, c) is narrower on the nasal side and has on its posterior surface four depressions which fit over the mounds of the implant.

Support of the prosthesis has several advantages. Since it is not supported by the fornix and lower lid, no inferior displacement of the prosthesis or sagging of the lower lid occurs. This is particularly helpful in elderly individuals who have poor tissue tonus. Support of the prosthesis with proper construction of its superior rim offers an adequate

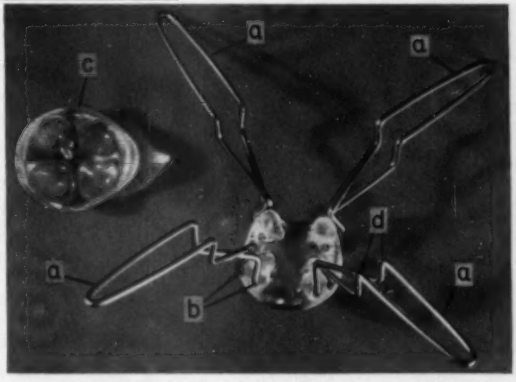

FIG. 2—Stainless steel wire clips (a) placed in holes (b) of implant before operation. Finger grips (d) for disengagement of clips from implant. Conformer (c) to be placed in socket immediately upon completion of surgical procedures.

The Iowa implant, although completely buried, has in part the desirable features of the integrated implant. These desirable features are (1) support of the prosthesis without major dependence on the lower lid and fornix, (2) good transmission of movements from the implant to the prosthesis, and (3) the prevention of cyclic rotation of the prosthesis. These are accomplished by the four rounded mounds on the front surface of the implant, which "key" into corresponding depressions in the back of the plastic prosthesis to support the prosthesis against gravitational pull and pressure from the upper lid. The lids, predominantly the upper, hold the prosthesis against the mounds.

fulcrum to the levator muscle, tending to prevent ptosis and inequalities of level of the upper lid. It also offers adequate bulk to the superior fornix, tending to prevent invagination of the upper lid.

Stone[6] lists four theories for the causation of invagination of the upper lid. They are (1) malposition of the superior rectus muscle, (2) loss of volume with removal of the globe, (3) atrophy of orbital fat, and (4) traumatic fracture and depression of the orbital floor.

In regard to malposition of the superior rectus, his argument is as follows: The superior rectus muscle is attached to the superior fornix and the levator

muscle. Displacement inferiorly, posteriorly, or anteriorly of the superior rectus at the time of surgical operation produces an indentation of the upper lid, where invagination usually occurs. Thus it is apparent with our particular implant that the superior rectus muscle may be brought forward and downward, which should produce the following changes: (1) an invagination of the upper lid, (2) possibly a ptosis, and (3) a diminution of the superior fornix. Perhaps we have a happy combination of factors with our implant. The superior fornices have been deep, and all cases of invagination of the upper lid and ptosis have been ameliorated by the proper construction of the prosthesis.

An implant which does not migrate and supports the prosthesis in a normal position does not require complete replacement of the volume of the normal globe.

The movement of the prosthesis within the range of "conversational" eye movement is immediate and adequate. Movement in extreme gaze is limited, as with all prostheses, by the extent of the conjunctival sac. However, movement of this implant is exceeded only by that of the truly integrated implants.

Cyclic rotation has been a problem in only one of all the Iowa implants used at this institution.

Preparation of the Acrylic Implant and Accessories

Sterilize and store the implant and its special conformer in 1:1000 benzalkonium chloride solution. *Never* autoclave or boil the implant. *Never* apply any common germicidal solution, alcohol, ether, or other solvent to the implant.

The stainless steel insertion clips may be sterilized as any other metal instruments.

Rinse the implant and conformer thoroughly with distilled water or saline solution before the surgical operation. Place each insertion clip into the two holes (b) at the outer side of each of the four mounds of the implant, as pictured in figure 2.

Anesthesia

The patient receives premedication, as any patient does who is to have local anesthesia. An O'Brien akinesia, a 2 cc. retrobulbar injection, and a 1 cc. injection beneath each rectus muscle comprise the anesthesia. In most cases this is adequate; however, in those cases where an inordinate amount of reaction and edema is present, general anesthesia may be preferred.

SURGICAL TECHNIQUE

Preparation of the Conjunctiva, Tenon's Capsule, and the Rectus Muscles

The conjunctiva and Tenon's capsule are incised down to the sclera and as close as possible to the cornea. This may be done either with scissors or a canaliculus knife. With these two structures held away from the globe, Stevens' scissors are inserted and spread in each quadrant between the muscles in order to free the adhesions of Tenon's capsule from the globe. Each rectus muscle is prepared similarly. A muscle hook is passed beneath the muscle and held with the handle toward the center of the cornea. If conjunctiva and Tenon's capsule are grasped immediately over the muscle and held away from the globe, a concavity parallel to the muscle insertion (fig. 3A, *a*) will be noted, beginning shortly behind the muscle insertion. This is the reflection of Tenon's capsule from the muscle sheath. If Stevens' scissors are spread in this concavity close to the muscle, the weaker structure will give and the muscle sheath will be en-

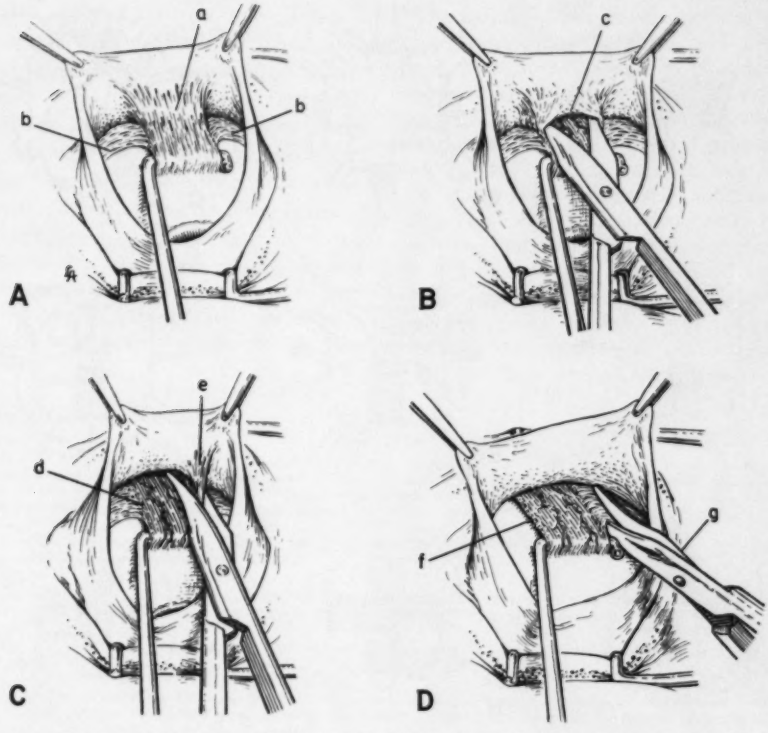

FIG. 3—A. Concavity (a) formed at point of reflection of Tenon's capsule and conjunctiva. Semischematic representation of intermuscular septum (b).

B. Opening (c) made in muscle sheath. Scissors are shown spread in cavity thus formed between sides of sheath still attached to edge of muscle.

C. Separation (d) of one side of muscle sheath, scissors in act of separating other side (e).

D. One edge (f) of muscle separated from intermuscular septum, scissors (g) cutting membrane at other edge of muscle.

tered as represented at *c* in figure 3B. Only fine adhesions of the sheath to the muscle exist, and they are broken easily by spreading. The sheath is then divided, as has been done at *d* in figure 3A, along each margin of the muscle back to the orifice in Tenon's capsule, through which the muscle passes to the orbit. The sides of the muscle sheath will be seen to run perpendicular to the globe, as *e* in figure 3C, before being cut. Parallel to the globe and inserting at the lateral margins of the muscle is the thin intermuscular septum, represented semischematically at *b* in figure 3A. This too must be divided, as has been done at *f* in figure 3D, back to the orifice in Tenon's capsule. After these fascial attachments have been severed, the muscle will be free of all attachments for 10 to 14 mm. The inferior rectus is an exception and, because of its proximity to the

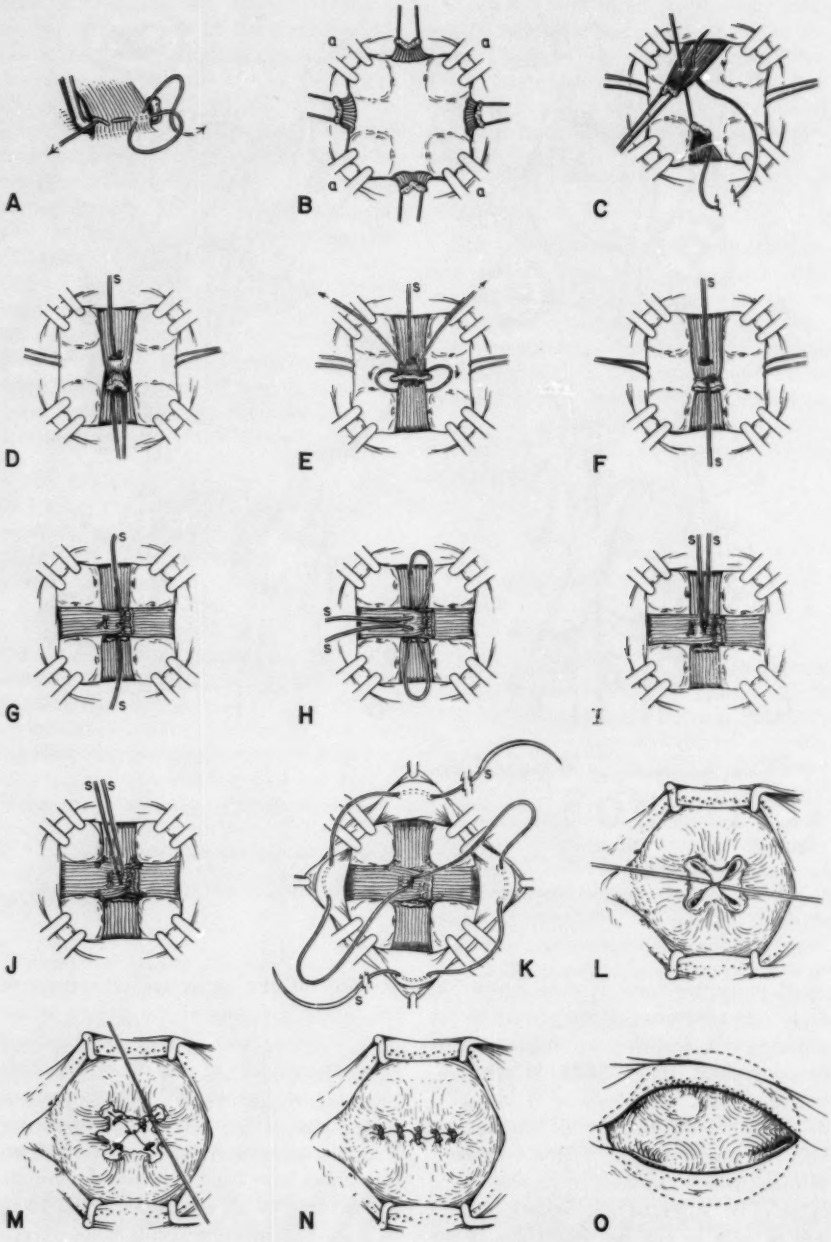

FIG. 4—Steps in the implantation surgery.

inferior oblique, the orifice in Tenon's capsule is further forward. Adequate mobilization of this muscle may be obtained, once it is removed from the globe, by spreading with scissors along the muscle to free it from the orifice in Tenon's capsule. The orifice must not be incised or orbital fat will herniate through Tenon's capsule. If the inferior rectus is not freed adequately, it will draw the inferior oblique forward and tend to obliterate the inferior fornix and to reduce the prominence of the mounds.

The handle of the muscle hook is reversed away from the globe, and a 4-0 chromic catgut lock suture is placed 1.5 mm. from the muscle insertion. The suture placement shown in figure 4A has worked well and will not slip if properly placed. The first stitch of the lock suture is through the muscle substance. The second stitch crosses diagonally beneath the first, and then passes through the loop, producing an overhand knot which incorporates muscle and is well anchored in it. In this procedure, 4-0 chromic catgut is used throughout. The muscle is then severed from the globe.

Legend of Fig. 4, continued

A. A double-arm 4-0 chromic catgut lock suture is placed 1.5 mm. back from each muscle insertion. At each margin of the muscle, the first stitch of the lock suture is through the muscle substance. The second stitch crosses diagonally beneath the first, and then passes through the loop, producing an overhand knot which incorporates muscle and is well anchored in it.

B. The implant in place supported by its jig of insertion clips. Note that the rectus muscles are oriented in line with the grooves between the mounds.

C. Sutures from the inferior rectus are passed through the superior rectus from beneath, 5.0 mm. back from the insertion and about one third of the way in from the edge of the muscle.

D. The suture is tied across the superior rectus. Note that one arm is saved as indicated at (S); the other is cut.

E. Each suture from the superior rectus is passed around and under the edge of the inferior rectus, then through inferior rectus and then superior rectus about one third the width of the muscle from the edge. The total imbrication is 5 to 5.5 mm.

F. The suture is tied across the superior rectus. Again one arm of the suture is saved and the other is cut.

G. The horizontal muscles are imbricated and sutured in a similar manner. All sutures of the horizontal muscles are cut, but the sutures from the vertical muscles are saved. Note that the lateral rectus is sandwiched between the medial rectus and the overlapped vertical muscles.

H. The sutures from the vertical muscles are passed up through the center of the imbricated horizontal muscles.

I. The sutures from the vertical muscles are tied across the center of the horizontal muscles. Once again, they are saved.

J. The muscles are expanded over the face of the implant by simple sutures through adjacent muscles next to each mound of the implant.

K. At four points exactly in line with each rectus muscle, the sutures previously saved are passed through Tenon's capsule for 4 mm., 3 mm. back from the edge. The sequence is important. One suture is placed in line with the lateral rectus, and then the inferior rectus. The other begins diametrically opposite in line with the medial rectus, and then the superior rectus.

L. The jig has been removed. Tying the two sutures produces a cloverleaf closure.

M. Each of three of the four loops of the cloverleaf is closed with a single suture. An exception, the superior temporal loop, requires two.

N. The conjunctiva is closed with five or more sutures to as near a horizontal line as the irregularity of the edges allows.

O. The conformer is placed in the socket immediately, the narrowest end toward the nose. Presence of the conformer and a pressure dressing markedly reduces postoperative edema.

The stump of the medial rectus may be cut long to facilitate grasping the globe for enucleation. If it should be cut short, a suture in the muscle stump works just as well.

Removal of the Globe

Severance of the superior oblique and inferior oblique muscles before enucleation of the globe has always seemed to facilitate placement of the enucleation scissors, particularly if the medial approach was used. These muscles do not limit abduction and only partially limit anterior displacement of the globe. However, they tend to limit lateral displacement of the globe. Severance of these muscles is certainly not necessary and should be omitted if these muscles are difficult to locate. If the lateral aspect of the superior rectus insertion is followed as it turns toward the posterior pole of the eye, it will be found to point directly toward the anterior aspect of the superior oblique insertion and often is almost continuous with it. The inferior oblique insertion is readily found by following back the inferior margin of the lateral rectus.

The enucleation scissors are spread on either side of the optic nerve to free further the posterior pole of the globe. The closed scissors define the optic nerve, and it is caught in the jaw and cut. The remaining fascial attachments are severed close to the globe as it is delivered.

There are three points of caution in regard to enucleation:

1. Care must be taken to avoid cutting the muscles or their sutures.
2. All active bleeding must be stopped.
3. If a large hole is cut in Tenon's capsule, it probably should be closed.

Bleeding within Tenon's capsule after implantation increases the probability of extrusion. There are several methods for freeing the optic nerve which incorporate a hemostat or other device to control bleeding. These devices tend to cause a larger hole in Tenon's capsule; therefore, the scissors alone have been used. A pack of gauze is placed in the socket and pressure applied to it for a few minutes. Tenon's capsule has never been closed posteriorly in this procedure, but it seems logical to close it if a large hole is present. In one case of endophthalmitis, an enucleation was done in order to obtain a specimen. Chloramphenicol, intramuscular suspension 40 per cent, was deposited in Tenon's capsule before placement of the implant. This implant was retained.

Implantation

The implant is placed in Tenon's capsule and held by its jig of four insertion clips (fig. 4B, a). The clips not only serve to support the implant but also retract the surrounding tissue and act as guides for the arrangement of muscles and sutures. The rectus muscles are aligned with the crossed grooves between the mounds.

Sutures from the inferior rectus are passed through the superior rectus from underneath, 5.0 mm. back from the insertion and about a third of the way in from the edge of the muscle (fig. 4C). The suture is tied across the superior rectus (fig. 4D). One arm is *saved,* as indicated at s; the other is cut. This suture will be preserved and utilized throughout much of the procedure.

Each suture from the superior rectus is passed around and under the edge of the inferior rectus, then up, first, through the inferior rectus, then through the superior rectus about one third of the width of the muscle from the edge (fig. 4E). This is done so that the muscles remain overlapped 5.0 to 5.5 mm. These sutures are tied over the superior rectus

(fig. 4F). Again one arm of the suture is saved (s) and the other is cut.

The horizontal muscles are overlapped, sutured, and tied in a similar manner (fig. 4G). All sutures of the horizontal muscles are cut, but continue to *save* the sutures (s and s) from the vertical muscles. Note that the lateral rectus is sandwiched between the medial and overlapped vertical rectus muscles. The lateral rectus deserves this secure position because of its more fragile structure and lesser vasculature. Dehiscence of the lateral rectus has figured in all three extrusions.

The sutures saved from the vertical muscles are passed upward through the center of the imbricated horizontal muscles (fig. 4H). The sutures are then tied across the center of the horizontal muscles (fig. 4I). This anchors the horizontal and vertical muscles together. The sutures (s and s) are once again *saved.*

The muscles are then expanded over the face of the implant by placing simple sutures through adjacent muscles next to each mound of the implant (fig. 4J).

Closure of Tenon's Capsule and Conjunctiva

Tenon's capsule is everted at four points exactly in line with each rectus muscle. The sutures previously saved are passed through Tenon's capsule for a distance of 4 mm., 3 mm. back from the edge (fig. 4K). The sequence of placement is important. Here one suture is placed in line with the lateral rectus and then in line with the inferior rectus. The other suture begins diametrically opposite to the first suture in line with the medial rectus and then in line with the superior rectus. The clips in the jig automatically disengage the implant when each is squeezed gently and lifted. Once these are removed, the suture arms are tightened, tied, and finally cut. This draws Tenon's capsule down against the center of the imbricated muscles (fig. 4L).

This closure of Tenon's capsule around the mounds favorably distributes the tissues and tensions within them. Thereby, the danger of thinning with tension necrosis is eliminated. Necrosis from the pinching of Tenon's capsule and conjunctiva between implant and prosthesis should be recognized as a result of poorly fitted plastic eyes. This does not imply that the greatest precision is required in the fitting, but reasonable care should be exercised. Three of the four loops of the clover leaf remaining are closed with one interrupted suture. The superior temporal one is an exception; two sutures are used here (fig. 4M). The complete closure of Tenon's capsule is the one great principle for permanence of the implantation. If five sutures do not adequately close Tenon's capsule, do not hesitate to add additional sutures.

The conjunctiva is closed with five or more catgut sutures to as near a horizontal line as the irregularity of the edges allows (fig. 4N). Any other closure might reduce the horizontal length of the cul-de-sac and limit the movement of the prosthesis.

The conformer is placed in the socket immediately, the narrowest end toward the nose (fig. 4O).

Presence of the conformer and a pressure dressing markedly reduces the postoperative edema. The dressing is removed five days postoperatively and the patient is sent home. No medication nor drops are prescribed. The patient may be fitted with a prosthesis four to six weeks postoperatively.

Fitting

The prosthetic fitting of this implant will be a subject for a later paper. It is

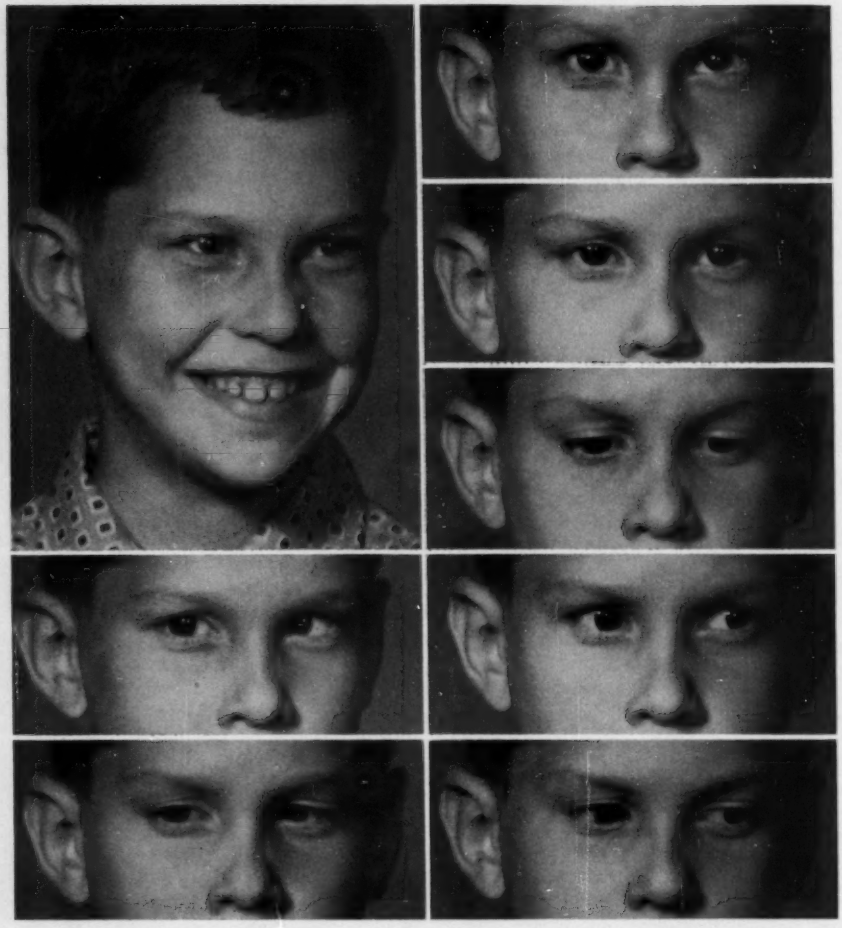

FIG. 5—Copies of individual frames from a 16 mm. color motion picture record the cosmetic appearance and motility achieved with the new implant and a custom-made prosthesis fitted by a modified impression technique.

sufficient now to say that an alginate impression type of fitting is used. For children who have not been able to cooperate in making an impression, the conformer has been used as a pattern for the prosthesis with good results. The average patient has required one adjustment after the original fitting. No recognizable change has occurred in most of these sockets after the first nine or ten months.

Results

From January 1957 through December 1959, sixty-nine such implants have been implanted. Three have extruded. One of the earlier ones extruded very soon after implantation because of an

oversimplification of the surgical procedure. Another extrusion was due to the failure to secure hemostasis at the time of operation. The cause of the last extrusion is unknown. It is suspected that a thin lateral rectus was not securely sandwiched between the medial rectus and overlapped vertical muscles. No implant has extruded because of erosion of Tenon's capsule and the conjunctiva.

fitted plastic eye are shown in figure 6. All four mounds of the implant are visible in this particular socket (A). This is desirable, but more commonly one or both of the inferior mounds are partially hidden by surrounding soft tissue. The latter result has not affected the function of the implant. However, the eye fitter should keep in mind that some, if not all, of the soft tissue can

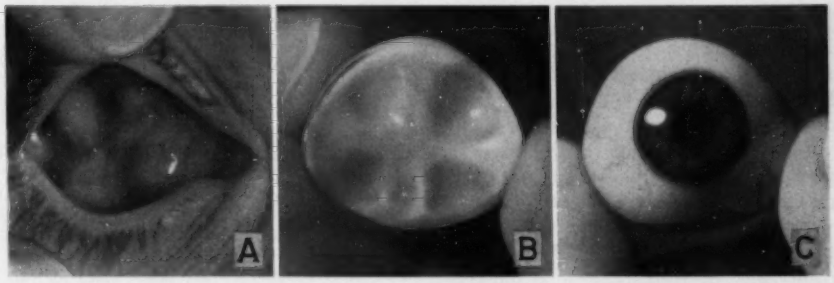

FIG. 6—The socket and plastic eye of the boy shown in figure 5.

A. Socket with all four mounds of the implant in evidence.

B. Posterior surface of prosthesis showing the four depressions corresponding to the mounds in the socket.

C. Anterior surface of the custom-made plastic eye. (Copies of small areas of frames from 16 mm. color motion picture. Motion picture film used: Commercial Ektachrome, type B.)

An example of the total cosmetic effect and motility which is possible with the new implant is shown in figure 5. The right eye of this nine-year-old boy was enucleated after a penetrating injury to the globe. In the pictures, the limitation of movement of the prosthetic eye in the extremities of gaze is evident. Such extreme movement is seldom used, and within the usual range of gaze the defect commonly passes unnoticed. The immediacy of movement cannot be demonstrated in still photographs. This is unfortunate, for immediate movement with the fellow eye is one of the implant's advantages over simple spheres.

A close-up view of the socket of the same patient and views of the custom-

be pressed away from the mounds by the proper shaping of the prosthesis.

The posterior surface of the plastic eye is shown in figure 6B. The four depressions fit over the mounds of the socket. The reader can visualize that, with the eye in place, the pressure of the upper lid keeps the depressions properly seated on the mounds. When the lower lid is pulled away from the eye, it remains well supported and will not drop downward as with other buried implants. It has been pointed out elsewhere that this support is most helpful in the elderly patient who has poor tissue tonus.

The anterior surface of the artificial eye is shown in figure 6C. The simplicity

of form of this eye is typical. In many cases, not even moderate distortion of the edges or anterior surface of the prosthesis has been required to correct ptosis, elevation of the temporal margin of the upper lid, or sagging of the lower lid. When such corrective measures have been necessary, the simple spheroid shape has been modified slightly.

SUMMARY

A quasi-integrated buried muscle cone implant, which has in part the desirable features of the integrated implant, has been presented. These desirable features are (1) support of the prosthesis without major dependence on the lower lid and fornix, (2) good transmission of movements from the implant to prosthesis, and (3) the prevention of cyclic rotation of the prosthesis. These are accomplished by four mounds on the front surface of the implant, which "key" into corresponding depressions in the back of the prosthesis to support the prosthesis against gravitational pull and pressure from the upper lid. The lids, predominantly the upper lid, hold the prosthesis against the mounds. The fitted prosthesis with this implant gives a superior cosmetic result in an individual of any age. It is particularly advantageous for the elderly individual with poor tissue tonus. The surgical technique designed for this implant is presented in detail. Over a 3-year period, sixty-nine implants have been placed; three have been extruded.

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DISCUSSION

MAURICE D. PEARLMAN, M.D., Chicago: The unique features of the Iowa implant, as you have seen, are the four mounds designed (1) to stabilize the reinforced double yoke of rectus muscles, and (2) to propel the ocular prosthesis efficiently. The engineering principles upon which they are based seem logical.

Although I have not used this new implant as yet, I will venture one comment on its surgical aspects, and one on its fitting aspects.

Surgically, a good result here will depend very much on the performance of a very careful enucleation wherein Tenon's capsule and the rectus muscles essentially are undamaged. For it is important to note this implant is not really attached to the muscles and will remain secure only as long as it is embraced by the muscles and overlying tissues anteriorly, and by Tenon's capsule posteriorly. Otherwise, the implant could rotate or shift out of position.

There are occasions when Tenon's capsule is deliberately incised during an enucleation in order to cut the optic nerve long; there are times, also, when Tenon's capsule is cut inadvertently during a difficult enucleation. Surgeons using this implant, therefore, or, for that matter, any other implant that is not attached directly to the muscles, should repair the rents in Tenon's capsule before implanting.

Regarding the fitting process: a custom-fitted and impression-molded eye is almost mandatory to assure an intimate articulation between the posterior face of the prosthesis

and the conjunctival surface. Furthermore, good technical judgment is necessary to set vertical and horizontal dimensions that will still allow for movements within the cul-de-sacs. The fitting also should "reduce to relative insignificance gapping of the supraorbital sulcus."

This gapping of the supraorbital sulcus troubles me despite my fitter's best efforts. He tells me that this is actually a dilemma, because when the prosthesis fills the superior fornix enough to erase the sulcus depression, it becomes top heavy and tends to tilt from pressure of the upper lid to force the lower edge forward.

I suggest that the authors and manufacturer explain in their film and instruction material how they overcome this problem.

Finally, one question: Why are you using only one size of implant?

A. D. RUEDEMANN, SR., M.D., Detroit: Lee Allen and the group at Iowa are to be sincerely congratulated on a very ingenious implant and on the competency of their surgical techniques. Further than that, Iowa is to be congratulated on having Lee Allen out there to fit these eyes, which, as you can see, cannot be done by any ordinary dispensing optician. This is a typical coordinated implant devised by a very fine institution.

The problem is going to be in the distribution and use of these eyes by the public. Perhaps the Society of Ocularists, that we now have associated here, might learn how to do this sufficiently well that it will not be necessary for patients to come back for frequent fittings.

There are several things about this implant that I might discuss. I am seeing it for the first time now, as you are.

One is that when you put in an implant, you replace orbital volume. If you wish to get rid of a superior sulcus, you must have volume in the orbit and posteriorly, so that you don't get a drag on the levator palpebrae muscle. The superior rectus drops down posteriorly-inferiorly and drags with it the levator; that forms the superior sulcus. If you have supporting material in the orbit, you eliminate that possibility.

The second question in my mind regards the collection of material behind the eye. Mucus or mucine is formed, and mucine must be put into solution by the tears. When there is an insufficient amount of tears or when there is no place for the mucine to gather, then the saprophytic organisms develop and an unpleasant odor results. It is necessary, in the main, to have as smooth a posterior to the eye or the shell as possible. The more material you push up forward, the less movement you can get from the muscles posteriorly. It is necessary to have as much volume in the back of the shell as possible.

I think that time is a big factor in this implant as you see it here today. I know that Lee Allen and the group at Iowa will gradually improve it. I am sure that this is going to be a very fine implant.

One other question I should like to raise here is with regard to the marked diminution of the numbers of enucleations that are necessary. The numbers for trying these out are not as many as they were formerly. The need for enucleation is rapidly fading; therefore, we will have to wait until large institutions, such as Iowa, will have sufficient numbers to tell us the true story.

DR. FERGUSON: I thank both Dr. Pearlman one of my old attending men, and Dr. Ruedemann for their remarks, even though I do not entirely agree with them.

With regard to Dr. Pearlman's remarks about the care with which the surgical procedure must be carried out, most of our residents seem to be able to do it, and I think that all of you should be able to do it, too. A certain amount of care must be exercised and the operation is a little more detailed than that required for the simpler types of implant; however, it is not difficult nor is the operating time lengthened appreciably.

Dr. Pearlman mentioned also that the implant is not perfectly attached to the muscles. There are holes at the inner base of each mound, and apparently through these holes the muscles very soon become attached to the implant by fibrous tissue. We have never had one tip in the socket.

In closing the posterior incision in Tenon's capsule, we have thought about whether the implant would migrate posteriorly, but this has not been our experience to date. Probably if

a large portion of optic nerve is removed and a large hole is cut in Tenon's capsule, this hole should be closed. Perhaps we will learn something about this in the future.

We agree that it is partly true that a good fitter is necessary to fit the custom prosthesis well. However, only reasonable precision is required for fitting. At the present time the business of fitting artificial eyes is about where the fitting of eye glasses was a number of years ago, when they might be obtained from the mail order house or from the dime store. There are many good fitters in this country, and what we need is more of them.

Dr. Pearlman also asked one very pertinent question with regard to the fact that the implant is made in only one size. It is the opinion of Mr. Allen, and I share this opinion, that the eye of a child is of sufficient volume to allow placement of this implant, which has a volume of about 3 cc. We have never found it necessary to fit a smaller implant in a child's orbit. I think that in the long run this will be an advantage, if an implant does increase the size of the orbit with time and growth.

With regard to Dr. Ruedemann's comment about frequent fittings, Mr. Allen has told me that with this implant only one adjustment of the fitting is usually necessary. In our experience, too, the patients have had only one adjustment after the first fitting.

Dr. Ruedemann believes that replacement of the volume of the globe is necessary to prevent a sunken superior orbital sulcus. I think that we have adequately shown that it is not necessarily true that you have to have complete replacement of the orbital volume in order to prevent ptosis or a sunken sulcus. If the prosthesis is held up by this positive integration, then the sulcus can be obliterated. Complete replacement of volume requires a shell prosthesis. This prosthesis lacks depth and does not guarantee that ptosis and a deepened sulcus will not occur.

With regard to the collection of secretions behind the eye, Mr. Allen has convinced me that this can be prevented by an adequately fitted prosthesis which fills all dead space. Thereby this material does not stagnate and cause irritation.

EXPERIENCES WITH VITREOUS PRESERVED BY LYOPHILIZATION

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A LITTLE more than 12 years ago, Cutler[3,4] reported on the transplantation of vitreous for a persistent and unabsorbed vitreous hemorrhage. Later in the same year Fritz and his co-workers[5,6] reported a technique for substituting cerebrospinal fluid for opaque vitreous. In 1957 Shafer[13] wrote of his experiences in the treatment of detached retinas with fresh vitreous implants and he defined the terms *vitreous implantation* and *transplantation*. Shafer's work has given great impetus to the use of vitreous in this country.

As early as 1953 Paufique and Moreau[8,10,11] began lyophilizing vitreous. This lyophilized material was used first in powdered form and inserted into the vitreous cavity through a trochar. The difficulties encountered in using this powdered form brought them to their present method of implantation.[9] The vitreous powder is now reconstituted in 2 cc. of sterile distilled water, and injected into the center of the vitreous cavity through a posterior sclerotomy. Paufique and Moreau now prefer lyophilized vitreous in their surgery because it can be used in a more concentrated form than fresh vitreous. This agrees with our findings as published in 1958.[7] They feel that the injected 2 cc. further dilutes and expands in the recipient eye to give the retina support. They are not concerned with the storage of vitreous, since fresh material is plentiful in France.

In this country, vitreous is not readily available, and the inadequate supply is not evenly distributed. Experiments were therefore started to determine the possibility of preserving and storing vitreous in a form that could be easily mailed throughout the country. The following studies were undertaken.

1. Method of Preservation
2. Methods of Storage
3. Bacteriological Studies
4. Animal Experimentation
5. Analysis of the Reports of the Clinical Use of Preserved Vitreous
6. Recent Modifications

From the Ocular Research Unit, Washington Hospital Center, Washington, D. C. (Dr. King, Dr. McTigue), and the Eye Research Section, Department of Surgery, Georgetown University Medical Center, Washington, D. C. (Dr. King, Dr. Chavan)

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1. METHOD OF PRESERVATION

In animal or human eyes, the cornea with a scleral rim,* iris, and lens are removed. The fresh vitreous is aspirated through a 15-gauge needle into a 5 cc. syringe. The anterior vitreous is often quite liquid; the posterior vitreous is more viscid. Care must be used in withdrawing the vitreous in order to avoid drawing retinal or uveal tissue into the syringe. With this method, 2 to 3 cc. of vitreous are obtained, with the amount averaging closer to 2 cc. The vitreous is then placed in a sterile Pyrex tube, and 1 cc. of an antibiotic solution containing neomycin, polymyxin B, and gramicidin† is added.

The antibiotic solution is added for two reasons—first, for its obvious antibacterial action and, second, because it seems to act as a filler in the lyophilization process. The addition of this filler results in a white powdered material which is more uniform and stable than vitreous lyophilized without it.

The Pyrex tube containing the vitreous and the antibiotic is then placed in a slush mixture of 95 per cent alcohol and dry ice and is frozen — a process which takes fifteen minutes. The tubes are removed from the slush and each tube is wrapped in aluminum foil containing dry ice. The tubes are attached to the manifold of the vacuum pump system.‡ The lyophilization process is started and requires an average time of sixteen hours. At the end of the run a dry white powder remains in the bottom of the specimen tubes. The tubes are sealed with an oxygen-gas flame technique, with care being exerted to maintain the vacuum in the system. The flame is far enough from the vitreous powder to prevent heating of the specimen. The vacuum is repeatedly checked during and after the cycle with a Tesla-type high frequency spark coil* which produces a faint, blue glow in the system as long as the vacuum is maintained.

2. METHODS OF STORAGE

Storage of the vitreous powder was observed at four different temperatures.

1. Room temperature (60° to 80° F.)
2. Ordinary refrigerator temperature (4° to 8° C.)
3. Supercooled temperatures (—30° to —56° C., deep-freezer or dry ice)
4. Body temperature (37° C., incubator)

Over a period of three to twenty-four months, the tubes were examined frequently for evidence of change in vacuum, for color, and for drying and architecture of the vitreous powder. These observations are shown in table I.

In any tube in which the vacuum was lost, regardless of the storage temperature, the vitreous powder became a yellow to brown, moist, collagenous mass. When a high vacuum was maintained, lyophilized vitreous stored at room temperature remained a white powder without shrinkage. If the vacuum was only moderately good, the powder changed to a yellow or pink color with slight shrinkage of the mass.

Similar observations were made on lyophilized vitreous stored at refrigerator temperature and at supercooled temperatures. As long as the high vacuum was maintained, the vitreous powder re-

*For use in corneal preservation.

†Neosporin solution, Burroughs, Wellcome & Co., Inc., Tuckahoe, N. Y.

‡Glassblowing Associates, Kensington, Md.

*Central Scientific Co., Chicago.

TABLE I

SCHEME OF STORAGE, OBSERVATION, AND RESULTS OF LYOPHILIZED VITREOUS

NUMBER AND DONOR VITREOUS	STORAGE TIME	TYPE OF VACUUM	TYPE OF STORAGE	COLOR	ARCHITECTURE, SHRINKAGE AND MOISTURE	CULTURES AND SMEARS
1-6 Rabbits	3 to 5 mo.	Good	Room temperature	White	Dry powder, no shrinkage	No growth in 48 hrs., nor cells, granular appearance
7-9 Rabbits	8 mo. 3 wk.	Good	Bottom shelf of refrigerator	White	Dry powder, no shrinkage	Same
10-12 Rabbits	4 mo. 1 wk.	Absent	Deep freezer	Yellow to brown	Collagenous mass, 3 + shrinkage, moist with ice crystals	Same
13-16 Cats	6 mo. 2 wk.	Good	Deep freezer	White	Dry powder, no shrinkage	Same
17-19 Cats	7 mo. 2 wk.	Absent	Bottom shelf of refrigerator	Yellow	Collagenous mass, 3 + shrinkage, moist with ice crystals	Same
21-23 Cats	3 mo. 1 wk.	Poor	Room temperature	Yellow	Dry powder, 1 + shrinkage	Same
24-27 Cats	4 mo. 1 wk.	Poor	Incubator	Pink	Dry powder, 2 + shrinkage	Same
28-30 Cats	8 mo. 2 wk.	Good	Room temperature	First white then slightly yellow	Dry powder, 1 + shrinkage	Same
31-35 Dogs	3 mo. 1 wk.	Good	Deep freezer	White	Dry powder, no shrinkage	Same
36-40 Dogs	6 mo. 3 wk.	Good	Bottom shelf of refrigerator	White	Dry powder, no shrinkage	Same
41-44 Dogs	8 mo. 2 wk.	Absent	Room temperature	Brown	Collagenous mass, 3 + shrinkage	Same
45-48 Dogs	4 mo. 3 wk.	Absent	Incubator	Pink	Collagenous mass, 3 + shrinkage	Same
49-51 Human	3 mo. 2 wk.	Good	Room temperature	White	Dry powder, no shrinkage	Same
52-54 Human	8 mo. 3 wk.	Good	Bottom shelf of refrigerator	White	Dry powder, no shrinkage	Same
55 Human	4 mo. 2 wk.	Good	Incubator	Pink	Dry powder, 2 + shrinkage	Same

TABLE II

HOMOLOGOUS AND HETEROLOGOUS VITREOUS TRANSPLANTATIONS

DONOR VITREOUS FRESH AND LYOPHILIZED	FRESH TRANSPLANTS	LYOPHILIZED TRANSPLANTS	RECIPIENTS
Homologous Transplants			
12 Rabbits	6	6	6 Rabbits
12 Cats	6	6	6 Cats
12 Dogs	6	6	6 Dogs
Heterologous Transplants			
12 Rabbits	6	6	6 Cats
12 Cats	6	6	6 Rabbits
12 Cats	6	6	6 Dogs
12 Dogs	6	6	6 Cats
12 Dogs	6	6	6 Rabbits
14 Humans	7	7	7 Rabbits
	55	55	55

mained white and there was no shrinkage. If the vacuum was only moderate, there was minimal shrinkage and slight color change. No change in any of these samples was noted on transferring them from the cool temperatures to room temperature.

Some of the vitreous powders in an incubator at body temperature remained white dry powder; others showed definite color change and moderate to marked shrinkage even when a high vacuum was maintained.

From these observations it was apparent that as long as a high vacuum was maintained, the vitreous powder could be stored at either room temperature or in an ordinary refrigerator for several months without evidence of change. Only the vitreous which remained a white dry powder was used in clinical operations. A final check on the vacuum was made just before it was used or packed for shipment.

In reconstituting the vitreous, the tubes were opened with an ordinary metal file, and sterile distilled water (without preservatives) was added. The amount of water added depended on the concentration or volume desired—2 cc. to 3 cc. will bring the material to its original volume; 1 cc. to 2 cc. will produce a concentrated form for injection.

3. BACTERIOLOGICAL STUDIES

Smears and cultures were taken from each reconstituted vitreous powder used in this study on storage temperatures. The smears were stained with a Romanowsky stain, and no organisms were found. Cultures on blood agar plates showed no growth after 48 hours of incubation at 37° C. (table I).

4. ANIMAL EXPERIMENTATION

Dogs, cats, and rabbits were used in these experiments and homologous and

TABLE III

HOMOLOGOUS VITREOUS TRANSPLANTS

NUMBER OF TRANSPLANTS	STORAGE TIME	SURGICAL TECHNIQUE (BILATERAL)	RESULTS OF TRANSPLANTS (MEDIA AND FUNDI)	COURSE (WEEKS)
3 Rabbits	3 mo.	Anterior. Fresh vitreous in one eye, lyophilized (powder) in other eye	Fresh; remained clear from beginning. Powder; volume of eye was reformed in 48 hrs.; finger tension normal in 4 days; media and fundi clear in one week.	9
3 Rabbits	5 mo.	Posterior. Fresh vitreous in one eye, lyophilized (rehydrated) in other eye	Fresh and rehydrated; remained clear from beginning; finger tension normal.	11
3 Cats	6 mo. 2 wk.	Anterior. Fresh vitreous in one eye, lyophilized (powder) in other eye	Fresh; hyphema in one case, otherwise all clear in one week. Powder-volume of eye was reformed in 60 hrs.; finger tension was normal in 4 to 5 days; vitreous opacities gradually cleared in 2 or 3 weeks.	12
3 Cats	6-7 mo. 2 wk.	Posterior. Fresh vitreous in one eye, lyophilized (rehydrated) in other eye	Fresh and rehydrated; small vitreous hemorrhage opacities gradually cleared in 3 to 6 weeks.	13
3 Dogs	3 mo. 1 wk.	Anterior. Fresh vitreous in one eye, lyophilized (powder) in other eye	Fresh and powder; vitreous hemorrhage and opacities gradually cleared in 3 to 6 weeks.	14
3 Dogs	6 mo. 3 wk.	Posterior. Fresh vitreous in one eye, lyophilized (rehydrated) in other eye	Fresh and rehydrated; cloudy, hemorrhage forming fibrous bands and opacities, gradually cleared in 6 to 8 weeks.	15

heterologous transplants were carried out. The anterior and posterior techniques for implanting vitreous were compared. The results are shown in tables II, III and IV.

In the anterior technique, the same type of incision was made as that which is used for a cataract operation. An intracapsular cataract extraction was performed by placing an erisophake on the lens capsule, lifting up with the erisophake, incising the zonule with Stevens' scissors, and stripping the remaining zonule as the lens was delivered with the sliding technique. Vitreous was usually lost in the operations. If vitreous was not lost, 1 cc. to 1.5 cc. was withdrawn through a blunt 18-gauge needle attached to a 2 cc. syringe. This procedure was carried out in both eyes of the recipient. Into one eye, 1 cc. to 1.5 cc. of fresh donor vitreous was injected. Into the other eye, lyophilized vitreous powder on a lens spoon was placed in the vitreous chamber through the pupil.

TABLE IV

HETEROLOGOUS VITREOUS TRANSPLANTS

NUMBER OF TRANSPLANTS	STORAGE TIME	SURGICAL TECHNIQUE (BILATERAL)	RESULTS OF TRANSPLANTS (MEDIA AND FUNDI)	COURSE (WEEKS)
3 Human to Rabbits	3 mo. 2 wk.	Anterior. Fresh vitreous in one eye, lyophilized (powder) in the other eye	Fresh—immediate coagulation of vitreous into gelatinous thick mass. Powder—gradually coagulated into gelatinous thick mass. In both—iritis, vitreous opacities, retinal detachment.	9
4 Human to Rabbits	4-8 mo. 3 wk.	Posterior. Fresh vitreous in one eye, lyophilized (rehydrated) in other eye	Fresh and rehydrated—coagulation of vitreous into thick gelatinous mass was quicker in fresh than lyophilized. Vitreous opacities, iritis, and retrolental membrane.	9
3 Rabbit to Cats	8 mo. 3 wk.	Anterior. Fresh vitreous in one eye, lyophilized (powder) in other eye	Fresh and powder—granual precipitation occurred. Vitreous opacities, hyphema, iritis, and retinal detachments.	9
3 Rabbit to Cats	4 mo. 1 wk.	Posterior. Fresh vitreous in one eye, lyophilized (rehydrated) in other eye	Fresh—appeared to precipitate faster than the rehydrated. Vitreous opacities. Iritis and cataract.	10
3 Cat to Rabbits	3-7 mo. 2 wk.	Anterior. Fresh vitreous in one eye, lyophilized (powder) in other eye	Fresh—precipitated faster than the powder. Iritis, vitreous degeneration, opacities, and band formation.	10
3 Cat to Rabbits	3-4 mo. 1 wk.	Posterior. Fresh vitreous in one eye, lyophilized (rehydrated) in other eye	Fresh—precipitated faster than rehydrated. Iritis, vitreous opacities, retrolental membrane.	10
3 Cat to Dogs	4 mo. 1 wk.	Anterior. Fresh vitreous in one eye, lyophilized (powder) in other eye	Fresh—precipitated faster than powder. Iritis, vitreous opacities and retinal detachment.	12
3 Cat to Dogs	8 mo. 2 wk.	Posterior. Fresh vitreous in one eye, lyophilized (rehydrated) in other eye	Fresh—precipitated faster than rehydrated. Iritis, vitreous opacities, vitreous hemorrhage, and retrolental membrane.	12
3 Dog to Cats	6 mo. 3 wk.	Anterior. Fresh vitreous in one eye, lyophilized (powder) in other eye	Fresh—coagulated faster than the powder. Severe iritis, degeneration of vitreous, hyphema, retinal detachment.	13
3 Dog to Cats	6-8 mo. 2 wk.	Posterior. Fresh vitreous in one eye, lyophilized (rehydrated) in other eye	Fresh—coagulated faster than rehydrated. Severe swelling of the lids, chemosis, iritis, vitreous traction bands and opacities.	13

TABLE IV, CONTINUED

HETEROLOGOUS VITREOUS TRANSPLANTS

NUMBER OF TRANSPLANTS	STORAGE TIME	SURGICAL TECHNIQUE (BILATERAL)	RESULTS OF TRANSPLANTS (MEDIA AND FUNDI)	COURSE (WEEKS)
3 Dog to Rabbits	4-8 mo. 2 wk.	Anterior. Fresh vitreous in one eye, lyophilized (powder) in other eye	Fresh—coagulated faster than preserved. Chemosis, iritis, degeneration of vitreous with opacities, soft eye.	14
3 Dog to Rabbits	4 mo. 3 wk.	Posterior. Fresh vitreous in one eye, lyophilized (rehydrated) in other eye	Fresh—coagulated faster than rehydrated. Severe iritis, vitreous hemorrhage, cataract, soft eye.	14

In the posterior technique, a 1.5 mm. incision was made in the sclera in the superior temporal quadrant in the equatorial region between preplaced, overlapping 4-0 silk sutures. Superficial diathermy applications were placed around the edges of the incision and over the suprachoroid beneath the scleral incision. The suprachoroid was then punctured by an 18-gauge needle on a 2 cc. syringe. The needle was passed into the center of the vitreous cavity under direct observation, and 1 cc. to 1.5 cc. of vitreous was removed. A syringe containing 1 cc. to 1.5 cc. of donor material was exchanged for the original syringe, and the donor material was injected into the center of the vitreous cavity. Fresh donor vitreous was injected into one eye and reconstituted; lyophilized vitreous was injected into the other eye. As the syringe and needle were being withdrawn, the assistant maintained steady traction on the overlapping mattress sutures, and after the needle was withdrawn, these sutures were tied.

Since an antibiotic solution was added to the vitreous before lyophilization, experiments were also carried out in which 0.1 cc. of an antibiotic solution containing neomycin, polymyxin B, and gramicidin was injected into the vitreous cavity through a posterior sclerotomy.

Postoperatively, all animals received daily doses of 150,000 units of penicillin intramuscularly for three days. An antibiotic ointment containing neomycin, polymyxin B, and gramicidin together with atropine ointment was instilled in each operated eye for three weeks. The animals were observed for a period of nine to twelve weeks. Observations were made grossly and by slit lamp examination. The animals were then sacrificed, and the eyes were enucleated for histopathologic studies of the vitreous in relation to its surrounding structures. The results of these experiments are shown in tables II, III and IV.

The posterior sclerotomy technique was found to be a relatively simple procedure. In cases in which homologous fresh vitreous or homologous, reconstituted, lyophilized vitreous were used, no reaction was noted as the material was injected. Immediate postoperative slit lamp examination revealed no reaction, and there was no difference in the appearance of the eyes with fresh implants and those with lyophilized implants. Ophthalmoscopic examination in the postoperative period showed small vit-

reous opacities in some cases, and in others there were small retinal and vitreous hemorrhages in the area of the sclerotomy. In a few of these cases, small organized bands extended into the vitreous from the site of the operation; otherwise, the fundi were normal. There was no evidence of retinal detachment in any of the cases. All of the changes noted cleared within three to five weeks except for a persistence of the organized bands in the few cases where they had formed. These bands were as frequent with fresh implants as with lyophilized implants. In the final results, there was no difference in the appearance of the eyes that had received fresh vitreous and those that had received reconstituted lyophilized vitreous.

In the experiments where the antibiotic solution alone was injected into the eyes of five recipient animals, there was no change in the appearance of the vitreous or the fundi. There was very little postoperative reaction, and all of the eyes appeared normal within four or five days.

In all cases, histopathologic studies revealed a normal appearance of the vitreous in relation to its surrounding structures.

Heterologous transplants were also performed. Both fresh and lyophilized donor material was used in each case. Human donor material was injected into rabbit vitreous. Rabbit donor material was injected into cats and dogs, and vice versa. Cat donor material was injected into dogs, and vice versa. In these experiments there was immediate coagulation of the donor material into a translucent gelatinous mass, which was seen grossly under direct observation. In all cases this mass became completely opaque on subsequent slit lamp examination, and a granulomatous uveitis appeared. In some, a dense membrane formed behind the lens. In others, the vitreous around the coagulated mass liquefied, and vitreolental and vitreoretinal traction bands could be seen. The rapidity of the changes varied with fresh donor material, and these changes seemed to be rapid in onset. The reactions were most rapid and severe when human material was injected into rabbit eyes. Histopathologic studies on these eyes showed the coagulated vitreous mass, the vitreolental and vitreoretinal membranes, and granulomatous uveitis noted grossly.

5. ANALYSIS OF THE REPORTS OF THE CLINICAL USE OF LYOPHILIZED VITREOUS

Reconstituted lyophilized vitreous has been used by twenty-one surgeons for a total of twenty-five operations. The operations involved both implants and transplants. The surgeons were polled on their experiences with preserved vitreous, and their replies are summarized below:

A. *Postoperative Reaction.* The surgeons were asked to grade the reaction from 1+ to 4+. The question was answered in fifteen cases. Of these, nine were graded as 1+, four as 2+, one as 3+, and one as 4+.

B. *Postoperative Infection.* This question was answered by thirteen surgeons. One postoperative infection was reported.

C. *Postoperative Appearance.* In the thirteen cases in which this query was answered, the vitreous was reported as being clear in seven cases and cloudy in six.

D. *Postoperative Results.* There were twenty replies to this question. Nine cases were reported with good results, eleven with poor results.

E. *Comparison of Fresh and Preserved Vitreous.* These surgeons who had used both fresh and preserved vitreous were asked to compare the two forms. Eight surgeons replied. Of these, six observed the reaction to be the same with both types, but two felt that the reaction was more severe with preserved vitreous.

F. *Preference for Fresh or Preserved Vitreous.* In stating their preference for the two forms to be used in the future, four surgeons preferred lyophilized vitreous, two preferred fresh vitreous, and three reported no preference.

G. *Convenience.* In the fourteen answers to this question, thirteen surgeons felt that the preserved form of vitreous was a definite convenience and one found it to be of no particular convenience.

Obviously, only a few surgeons have reported, and the total number of cases in which this material has been used are also limited. This summary of our poll presents the clinical experience with lyophilized vitreous to date.

6. RECENT MODIFICATIONS

Following the work of Paufique and Moreau[8-11] in which they reported the successful lyophilization of vitreous without the addition of antibiotics or other filler substances, we have attempted to modify our technique along these same lines. We felt that it would be advisable to eliminate, if possible, all foreign material from the vitreous. The risk in the injection of vitreous alone, with its potential antigen-antibody reaction, is significant in itself. The presence of antibiotics adds other potentially irritating and sensitive substances. It should be noted, however, that the freeze-drying process has no antibacterial action. On the contrary, bacteria that are ordinarily killed by drying alone may be viable after lyophilization.[1] The safety of using the material with the antibiotic addition would depend a great deal on the self-sterilizing properties of vitreous, as reported by Shafer.[2] Since this self-sterilizing property is still under study, we feel that for the present it is safer to add the antibiotics and risk the inflammation they may cause. As previously pointed out, the antibiotic alone caused only mild reaction when injected into animal vitreous.

In handling preserved vitreous at the time of operation, the Pyrex tube has proved troublesome. The tubes are difficult to open. The glass has occasionally shattered when the vacuum was suddenly released, and the presence of fine glass particles has made it impossible to use the reconstituted vitreous.

To offset these drawbacks, the shape of the tube has been modified in two ways. First, the bottom of the tube has been flattened, which allows a larger surface area for the frozen vitreous and thus speeds up the drying process. Second, the neck of the specimen tube has been narrowed in an attempt to make the opening of the tubes less arduous and more accurate. We are experimenting with specimen tubes made of ordinary glass, which will be much easier to open than the Pyrex tubes.

Paufique, Fayet, and Ravault[12] have recently reported a comparative study of certain chemical and physical properties of fresh and lyophilized vitreous. The index of refraction, viscosity, electrical conductivity, hyaluronic acid content, glucose content, total protein content, total nitrogen content, and electrophoretic patterns of the protein components were compared. From their studies they concluded that lyophilization does not modify any of these chemical and physical

properties of vitreous. We are repeating these studies, and will report our results as soon as they are completed.

The interesting question of whether or not lyophilization alters the antigen specificity of vitreous is still to be investigated.

CONCLUSIONS

A method for the preservation of human vitreous has been reported. Vitreous preserved in this manner offers the convenience of being readily available, easy to ship, and safely stored at room temperature for long periods (at least 24 months). The vitreous should be a dry, white, or faintly pink powder at the time of its use. It is reconstituted with sterile distilled water, and should appear as a somewhat viscid, clear, colorless solution in the concentration or volume desired. If these conditions are not met, the material should not be used.

In animal experiments, lyophilized vitreous and fresh vitreous appeared to be equal as far as operative and postoperative reaction were concerned, and in the final result of the experiment. Similarly, in histopathologic studies there was no difference in the appearance of the vitreous or in its relationship to its surrounding structures.

The posterior sclerotomy approach for implanting vitreous was found to be superior to the anterior approach. The latter would be feasible, of course, only in aphakia. Reconstituted vitreous was easier to handle and inject than the powdered form.

Heterologous transplants were attempted but were complete failures with both fresh and lyophilized vitreous. There was some indication that the onset of the reaction was slower and perhaps less severe with the lyophilized vitreous.

Certain chemical and physical properties of both fresh and preserved vitreous have been compared by Paufique and his co-workers.[12] They report that lyophilization does not modify any of the properties studied.

Finally, the clinical reports on the use of lyophilized vitreous are summarized. Vitreous implants and transplants, whether fresh or preserved, are still new procedures and are still being evaluated. This paper does not attempt further evaluation of these procedures but only reports on the feasibility of using a preserved form of vitreous, when and if vitreous is indicated. The majority of the surgeons who have used both forms felt that they were about equal in postoperative reaction and final operative result. They found the preserved form a definite convenience, which is probably due to the fact that most of the surgeons who have used it are not operating in the large centers where fresh vitreous is readily available. Its convenience has been particularly noteworthy in five emergency cases, where it was readily available to replace vitreous lost in traumatic ruptures of the globe.

SUMMARY

1. A method for the preservation of vitreous by lyophilization is presented.

2. Lyophilized vitreous may be stored at room temperatures for at least twenty-four months without change.

3. This preparation is suitable for shipping long distances without special care.

4. It is readily reconstituted in sterile distilled water.

5. Animal experimentation has shown preserved vitreous to be similar to fresh

vitreous as far as surgical results and histopathologic studies are concerned.

6. Bacteriologic studies of reconstituted vitreous powder were negative.

7. The majority of the surgeons who have used both fresh and preserved vitreous have found the two to be about equal in operative reaction and postoperative results.

8. Current modifications in the technique of lyophilization are described. It is hoped these changes will facilitate the handling of the material at the time of operation.

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THE NATURE OF THE ANTIBACTERIAL EFFECT OF HUMAN VITREOUS

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THE demonstration of what was taken to be an antibacterial effect of human vitreous was reported by Shafer[4] in 1957 and the observations were subsequently confirmed by Reed, Wilt and Tushingham.[3] The latter authors tested the activity of human, rabbit and dog vitreous against Staphylococcus aureus, Streptococcus pyogenes, Escherichia coli, Pseudomonas aeruginosa, Proteus vulgaris and Bacillus subtilis. Only human vitreous exhibited antibacterial activity, and spore-forming Bacillus subtilis was the only bacterium of those tested which was not inhibited. The methods employed in their study included tube dilutions of the bacteria in 0.5 milliliters of vitreous stored at 4 degrees C. from which blood agar plates were periodically inoculated and incubated to determine the presence or absence of viable bacteria. Colony counts of the bacteria thus cultured showed a progressive decrease with increase in the time of refrigeration of the vitreous-bacteria mixtures.

More recently, Bussey, Shafer and Hughes[1] reported additional studies of this phenomenon. In addition to tube dilutions of bacteria in vitreous, these authors tested vitreous by placing it in wells in blood agar plates seeded with various bacteria. After incubation of the plates at 37 degrees C., zones of inhibition of bacterial growth were noted around the vitreous wells. Again it was observed that this antibacterial effect appeared to be a property only of human vitreous. While the aforementioned authors speculated as to the nature of this property peculiar to human vitreous, no definite characterization of the substance or substances responsible was made.

Although Shafer[5] has reported that his group has never had a positive culture on blood agar in hundreds of vitreous samples cultured since 1947, provided the vitreous had been refrigerated for forty-eight hours at 40 degrees F. (4 degrees C.), Pischel's experience[2] was less favorable in this regard. Suie and Sroufe[6] also failed to demonstrate bactericidal properties of human vitreous. They presented preliminary data indicating that four organisms (Streptococcus pyogenes, Klebsiella pneumoniae, Escherichia coli and Pseudomonas aeruginosa) exhibited growth when incubated at 37 degrees C. in both "normal human vitreous" and human vitreous heated at 70 degrees C. for one hour. The difference among the techniques used in the studies cited is apparent, and it has been further suggested by Bussey and his colleagues[1] that the failure to demonstrate antibacterial effect in the experiments of Suie and Sroufe may have been due to the strength of the bacterial inoculum.

In an effort to clarify the possibility that human vitreous contains a heretofore unidentified antibacterial substance, the present studies were initiated. When

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individual samples of human vitreous were tested in the manner to be described, it became apparent that some samples inhibited bacterial growth while others had no obvious inhibitory effect. It was considered possible that this curious variation among individual vitreous samples might be due to prior antibiotic administration to the eye donors. Therefore, the present studies were aimed most particularly at determining whether or not antibiotics given to the eye donors might be responsible for the antibacterial effect of vitreous.

MATERIALS AND METHODS

Vitreous was aspirated through an 18-gauge needle, under aseptic conditions, from human eyes obtained from the Boston Eye Bank or after enucleation from patients at the Massachusetts Eye and Ear Infirmary. The vitreous from each eye was then stored in individual sterile tubes at 4 degrees C. In an occasional instance a donor eye was quickly frozen and stored at minus 5 degrees C.; vitreous was subsequently aspirated and stored in the usual manner. After storage for periods of one day to several weeks, the vitreous samples were cultured on blood agar to determine the presence or absence of bacterial contamination. If the samples were found to be free of bacterial contamination, they were tested for antibacterial effect against a standard strain of Staphylococcus aureus (strain M_W, Massachusetts General Hospital). A few samples were also tested against a strain of Pseudomonas aeruginosa.

Blood agar plates were seeded over their entire surface with a fresh culture of Staphylococcus aureus or Pseudomonas aeruginosa. Full-thickness wells were then trephined in the blood agar and filled with 0.15 to 0.25 milliliter of stored vitreous. The amount of vitreous varied slightly with the thickness of the blood agar and, hence, the depth of the well, but it was uniform for each individual blood agar plate. Various antibiotic discs were added for the purpose of making comparative observations. The plates were incubated for twenty-four hours at 37 degrees C.

In some instances penicillinase,* 100 units per milliliter, was added to the vitreous immediately prior to incubation.

RESULTS

As was remarked in the introduction, some vitreous samples inhibited bacterial growth but others did not. The hospital records of all vitreous donors were examined, and patients admitted for enucleation were questioned to determine whether or not antibiotics had been administered prior to enucleation. The results (table I) indicate that the antibacterial effect of these human vitreous samples is associated with the systemic administration of antibiotics just prior to enucleation and aspiration of the vitreous. A blood agar plate illustrating the variation in antibacterial effect of different vitreous samples is shown in figure 1.

A few vitreous samples which showed an antibacterial effect were obtained from donors who had no record of antibiotic administration prior to enucleation (table II). These samples, however, came from eyes used for corneal transplantation, and the eyes had been rinsed with a solution of polymyxin B sulfate, 0.10 per cent, and neomycin sulfate, 0.50 per cent, which remained in contact with the eyes during storage prior to corneal transplantation and subsequent aspiration of the vitreous.

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TABLE I

RELATION OF ANTIBACTERIAL ACTIVITY OF HUMAN VITREOUS TO ANTIBIOTICS RECEIVED BY VITREOUS DONORS

VITREOUS SAMPLE	ANTIBIOTICS RECEIVED BY DONORS (DOSAGE SCHEDULE)	ANTIBACTERIAL ACTIVITY[1]
F. C.	None[2]	0
C. C.	None	0
L. H. (a)	None	0
M. C.	None	0
T. A.	None	0
Ab. S.	None	0
M. M.	None	0
C. H.	None	0
B. H.	None	0
K. R.	None	0
V. L.	None except 3 drops of polymyxin B-neomycin and 1 instillation of chloramphenicol locally 12 hours preoperatively	0
J. A.	None except 5 drops of polymyxin B-neomycin 12 to 8 hours preoperatively	0
B. O.	None except 7 drops of polymyxin B-neomycin 17 to 3 hours preoperatively	0
Al. S.	None	0
H. D.	None	0
M. B.	Penicillin, 1 million units intramuscularly every 2 hours and chloramphenicol, 1 gram every 6 hours for 2 days prior to death	6-7
Ma. M.	Penicillin, 400,000 units every day for 10 days, Streptomycin, 0.5 gram on day of death	3
G. M.	Vancomycin, 0.5 gram four times a day, or Kanamycin, 0.5 gram twice daily for several days prior to death. Vancomycin, 0.5 gram, intravenously twice on the day prior to death	15
H. F.	Penicillin, 1 million units aqueous, then 600,000 units procaine 6 hours later, and chloramphenicol, 0.5 gram every 6 hours for 2 doses on the day prior to death	2-5
An. S.	Penicillin, 300,000 units, every 6 hours and Streptomycin, 0.25 gram, every 6 hours for several days prior to death	4
B. P.	Penicillin, 600,000 units intramuscularly every 6 hours and chloramphenicol, 1 gram intravenously, then 0.5 gram every 6 hours for 2 days prior to death	3-5

1. Antibacterial activity is expressed as the width in millimeters of the zone of inhibition of *Staphylococcus aureus* around the vitreous well.

2. *None* indicates that no systemic antibiotics were received by the donors for at least five days prior to death. The exception to this is donor H. D., who died suddenly due to acute myocardial infarction and whose documented freedom from antibiotics is only one day.

TABLE I, *Continued*

RELATION OF ANTIBACTERIAL ACTIVITY OF HUMAN VITREOUS TO ANTIBIOTICS RECEIVED BY VITREOUS DONORS

VITREOUS SAMPLE	ANTIBIOTICS RECEIVED BY DONORS (DOSAGE SCHEDULE)	ANTIBACTERIAL ACTIVITY[1]
M. S.	Penicillin, 1 million units aqueous, then 600,000 units procaine intramuscularly every 4 hours for 5 doses, last dose 1.5 hours before enucleation	3
R. A.	Penicillin, 500,000 units aqueous, intramuscularly for 3 doses during 20 hours before enucleation, last dose 5 hours before enucleation	2
A. K.	Penicillin, 600,000 units aqueous intramuscularly, then 600,000 units procaine every 6 hours for 3 days prior to death	13

TABLE II

THE RELATION OF POST-ENUCLEATION EXPOSURE OF EYES TO ANTIBIOTICS AND THE ANTIBACTERIAL EFFECT OF VITREOUS

VITREOUS SAMPLE	DURATION OF EXPOSURE TO POLYMYXIN B-NEOMYCIN[1]	ANTIBACTERIAL ACTIVITY[2]
L. H. (a)	None	0
L. H. (b)	7 weeks at —5 degrees C. 1 day at 4 degrees C.	10.0
J. S.	2 days at 4 degrees C.	6.5
M. W.	3 days at 4 degrees C.	5.0
J. W. (a)	3 days at 4 degrees C.	8-10
J. W. (b)	9 days at —5 degrees C. 1 day at 4 degrees C.	6.0
I. W.	2 days at 4 degrees C.	10.0
A. D.	3 days at 4 degrees C.	6.5

1. Polymyxin B sulfate, 0.10 per cent, and neomycin sulfate, 0.50 per cent.

2. Antibacterial activity is expressed as the width in millimeters of the zone of inhibition of *Staphylococcus aureus* around the vitreous well.

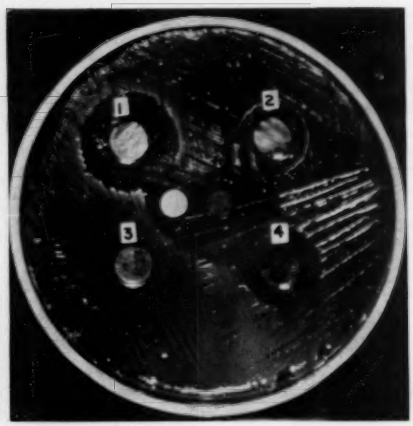

FIG. 1—Antibacterial activity of four samples of human vitreous showing variation in the inhibition of the growth of Staphylococcus aureus after twenty-four hours at 37 degrees C. (1) J. S.; (2) H. F.; (3) H. D.; (4) An. S. The centrally placed antibiotic discs are chloramphenicol, 5 mcg. (left), and penicillin, 2 units (right).

An opportunity to test the validity of the assumption that this contact was sufficient to cause the inhibitory effect of the vitreous presented itself when a pair of eyes from a single donor became available. Vitreous was aspirated from one eye shortly after death. The other eye was rinsed in the polymyxin B-neomycin solution, frozen, and stored for several weeks. After thawing and further storage at 4 degrees C. for one day, the vitreous was aspirated. The antibacterial activity of these two samples is demonstrated in figure 2 (1) and (2).

The marked inhibition of bacterial growth by vitreous sample L. H. (b) contrasts strikingly with the lack of inhibition exhibited by vitreous sample L. H. (a), and by vitreous sample V. L., which was obtained from an eye which had received locally only a small amount of the polymyxin B-neomycin solution, and one instillation of chloramphenicol ointment twelve hours preoperatively. It is assumed that the lack of inhibition by this last sample indicates that significant levels of antibiotics in the vitreous were not achieved by this instillation into the conjunctival sac.

If the antibacterial effect of vitreous should be due to the presence of penicillin, then it might be expected that penicillinase would negate this effect. To test this hypothesis, the following experiment was done. Patient M. S. was admitted to the hospital for enucleation of one eye with absolute glaucoma. The patient denied receiving antibiotics prior to admission. The patient was given 1,000,000 units of aqueous penicillin intramuscularly, and then 600,000 units of procaine penicillin intramuscularly every four hours for five doses, the last dose being administered two hours before enucleation. Vitreous obtained from this eye was tested and found to

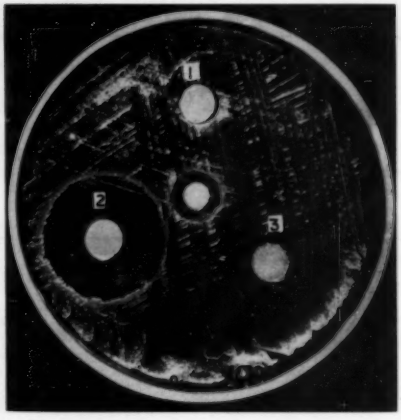

FIG. 2—Antibacterial activity of human vitreous as evidenced by inhibition of the growth of Staphylococcus aureus after twenty-four hours at 37 degrees C. (1) L. H. (a), no exposure to antibiotics; (2) L. H. (b), postenucleation exposure to antibiotics; (3) V. L., local preoperative exposure to antibiotics. Centrally placed antibiotic disc is chloramphenicol, 5 mcg.

have an antibacterial effect. The addition of penicillinase to the vitreous eliminated the antibacterial effect (fig. 3).

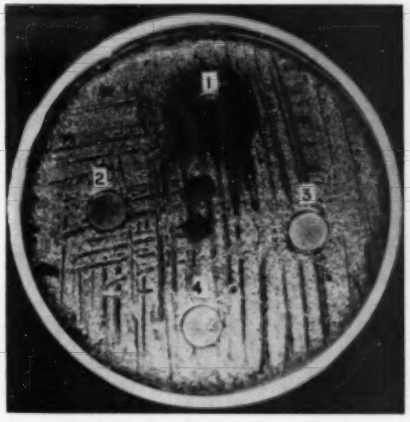

FIG. 3—Effect of penicillinase upon the antibacterial activity of vitreous from donor M. S. (1) M. S.; (2) M. S. with one drop of penicillinase; (3) M. S. with two drops of penicillinase; (4) M. S. with three drops of penicillinase. Centrally placed antibiotic discs are both penicillin, 2 units, with two drops of penicillinase added to each disc.

Similarly, R. A., a patient admitted for enucleation of a disorganized globe and who denied receiving antibiotics prior to admission, was given 500,000 units of aqueous penicillin intramuscularly for three doses during the twenty hours prior to enucleation. Vitreous from this eye was found to have an antibacterial effect which could be eliminated by penicillinase.

Vitreous samples from other donors who were known to have received only penicillin were not numerous in this small series. However, those samples in this category were tested, as were samples obtained from the two patients mentioned, by adding from one to three drops of penicillinase, 100 units per milliliter, to 0.2 milliliter of vitreous, and were compared with 0.2 milliliter of the same vitreous without penicillinase. The elimination of the antibacterial effect of these vitreous samples by penicillinase is summarized in table III and illustrated in figure 4. The specific

TABLE III

EFFECT OF PENICILLINASE UPON THE ANTIBACTERIAL ACTIVITY OF HUMAN VITREOUS FROM DONORS TREATED WITH PENICILLIN

VITREOUS SAMPLE	ANTIBIOTICS RECEIVED BY VITREOUS DONORS[1]	ANTIBACTERIAL ACTIVITY[2]	
		WITHOUT PENICILLINASE	WITH PENICILLINASE
M. S.	Penicillin	5-6	0
R. A.	Penicillin	2	0
A. K.	Penicillin	12	0
H. F.	Penicillin and Chloramphenicol (1 gram)	3	0
An. S.	Penicillin and Streptomycin (1)	3	2
	(2)	5	4

1. Dosage of antibiotics received is listed in table I.

2. Antibacterial activity is expressed as the width in millimeters of the zone of inhibition of *Staphylococcus aureus* around the vitreous well.

FIG. 4—Effect of penicillinase on the antibacterial activity of vitreous from two donors. (1) H. F.; (2) H. F. with two drops of penicillinase; (3) An. S.; (4) An. S. with two drops of penicillinase. Centrally placed antibiotic disc is penicillin, 2 units.

FIG. 5—Antibacterial activity of human vitreous showing variation in inhibition of growth of Pseudomonas aeruginosa after twenty-four hours at 37 degrees C. (1) L. H. (a); (2) L. H. (b); (3) J. W. (a); (4) J. W. (b). Centrally placed antibiotic discs are neomycin, 30 mcg. (left), and polymyxin B, 30 mcg. (right).

TABLE IV

EFFECT OF HUMAN VITREOUS UPON PSEUDOMONAS AERUGINOSA

VITREOUS SAMPLE	EXPOSURE TO ANTIBIOTICS[1] (DURATION)	ANTIBACTERIAL ACTIVITY[2]
L. H. (a)	None	0
L. H. (b)	7 weeks at —5 degrees C. 1 day at 4 degrees C.	4.0
J. W. (a)	3 days at 4 degrees C.	0
J. W. (b)	9 days at —5 degrees C. 1 day at 4 degrees C.	0.5
I. W.	2 days at 4 degrees C.	0
J. S.	2 days at 4 degrees C.	1.0
M. W.	3 days at 4 degrees C.	0
A. D.	3 days at 4 degrees C.	3.0
H. F.	Penicillin and Chloramphenicol prior to death[3]	0

1. All samples were exposed only to polymyxin B-neomycin after enucleation except L. H. (a) and H. F.

2. Antibacterial activity is expressed as the width in millimeters of the zone of inhibition of *Pseudomonas aeruginosa* around the vitreous well.

3. Dosage of antibiotics received listed in table I.

effect of penicillinase is demonstrated by its lack of effect upon vitreous samples containing antibiotics other than penicillin.

The few samples of vitreous tested for antibacterial effect against Pseudomonas aeruginosa were mostly those from eyes previously exposed to polymyxin B and neomycin. The results are summarized in table IV and illustrated in figure 5. Neither the sample L. H. (a), not exposed to antibiotics, nor the sample H. F., exposed to penicillin and chloramphenicol, demonstrated antibacterial activity. It is of interest that some of the samples exposed to polymyxin B-neomycin also lacked demonstrable antibacterial activity against Pseudomonas aeruginosa, although they did inhibit the growth of Staphylococcus aureus (table II). It is possible that this difference in the antibacterial activity of a given vitreous sample is due to the quite different sensitivity of the two bacteria used in this study. Since the concentration of the antibiotics in the vitreous is not known, any further explanation must be speculative.

COMMENT

While the present study is by no means exhaustive, it would appear that the antibacterial effect of human vitreous is due to the presence of antibiotics administered systemically to the donors shortly before the aspiration of the vitreous or, in some instances, applied to the eyes after enucleation but before aspiration of the vitreous. (Bovine and feline vitreous samples tested did not inhibit bacterial growth.)

Most of the eyes obtained at the Boston Eye Bank were not rinsed with antibiotics prior to aspiration of the vitreous, and it may be that at other eye banks where vitreous has been obtained, application of antibiotics to donor eyes is routine. If so, this may have contributed to the uniformity of antibacterial effect observed by others. In addition, the pooling of vitreous would tend to disperse the effect of antibiotics among more samples; this, too, may have contributed to the uniformity of previous observations.

The effect of refrigeration upon the vitreous or upon the bacteria was not specifically studied, although it was noted that the presence or absence of antibacterial effect did not appear to be related to the length of time the vitreous was stored prior to testing. The data of Bussey and his colleagues[1] comparing the strengths of bacterial inocula killed by vitreous at 4 and at 37 degrees C. suggest that refrigeration does enhance the antibacterial effect. It would seem reasonable to suppose that retardation of bacterial multiplication permitted an initially larger number of bacteria to be eliminated by the antibiotic(s) in the vitreous.

The zone of inhibition around the vitreous samples was, in many instances, observed to be greater than that around various antibiotic discs. This had been noted previously by Shafer. Although this may be related to the absolute amounts of antibiotics present, an alternative possibility is that while the antibiotic within an initially dry disc is diffusing in a gel, the antibiotic within the vitreous is already in solution and may thus diffuse more readily. Within four hours or so after the vitreous has been placed in the well, the well is empty except for what appear to be a few fine fibrin-like strands. It is probable that the vitreous gel undergoes syneresis, leaving the fluid portion free to diffuse into the surrounding agar. The rate of disappearance of the vitreous from the well apparently is not related to the size or depth of the well (i.e., full or partial thickness) but is related to the amount of vitreous initially placed in the well.

CONCLUSION

Studies of individual human vitreous samples, using a simple agar diffusion technique, indicate that the antibacterial activity, when present, is related to the presence of antibiotics in the vitreous.

ACKNOWLEDGMENTS

I should like to express my appreciation to the members of the staff of the Howe Laboratory for their advice and encouragement, especially to Dr. David G. Cogan, Director, for valuable criticism and advice in the preparation of this report, and to Dr. David D. Donaldson and Miss Inez Berry for their assistance in the preparation of the photomicrographs.

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DISCUSSION

DONALD M. SHAFER, M.D., Chicago: First I wish to thank the Academy for giving me the opportunity to discuss this challenging study by Dr. Hill. Since I first reported in 1957 that our samples of human vitreous, being collected for retinal surgery, were consistently sterile after refrigeration, I have been intrigued as to why. Indeed, Dr. Bussey, who participated in our second paper on the subject, said he was delighted that this strange vitreous behavior had stimulated Dr. Hill to study it further. Dr. Hill is to be congratulated on the careful and graphic work that he has presented. I'm sure it represents hours and hours of tedious labor.

I must admit that in the time we had to prepare this discussion we did a spot check on Dr. Hill, and plated out inhibition plates from known antibiotic-treated and known antibiotic-free vitreous, and found the same effect he described.

However, not in a sense of criticism, but in order to evaluate the problem of vitreous sterility as well as we can, there are a few points I would like to mention.

It is noted in Dr. Hill's paper that every vitreous sample from a person who had systemic antibiotics showed antibacterial activity, and, conversely, not one vitreous sample from a donor who had had no systemic antibiotics showed any antibacterial activity. At this rate, then, practically every eye coming into the Eye Banks today must have come from an antibiotic-treated donor, because our vitreous samples tested in the past have consistently shown this antibacterial activity. It is true that at the Eye Bank we have not, up to now, known whether the donor had antibiotics or not.

Also, vitreous from another source—cadaver eyes—has been tested by a completely independent group. Reed, Wilt, and Tushingham at the University of Manitoba have twice confirmed the antibacterial effect of human vitreous from this source. Thus two independent groups at two widely separated laboratories would have had to be always testing antibiotic vitreous. This high frequency rate of antibiotic vitreous would seem improbable, but it cannot be denied.

Another point of interest is how does the donor vitreous have enough antibiotic potency to inhibit bacteria when the penetration of antibiotics, other than chloramphenicol into the vitreous body is supposed to be so poor. Dr. Bussey and I discussed this possibility when we were preparing our paper and discarded it as unlikely to affect vitreous sterility. Our thinking was based on well substantiated statements such as Leopold's, who said in discussing the use of chloramphenicol treatment of endophthalmitis, that "poor intraocular penetration of other antibiotics made such (intravitreal) injections necessary."[4]

It is interesting to note that Dr. Hill's vitreous sample G. M., which showed the highest antibacterial activity, was from a patient who had received Vancomycin or Kanamycin for several days prior to death, and Vancomycin twice on the day prior to death. Yet a repre-

sentative of Lilly Laboratories, manufacturers of Vancomycin, had stated (Sept. 3, 1959) that intramuscular injections of 25 mg. of Vancomycin per kilogram gave good blood levels in rabbits, but no penetration in either the aqueous or vitreous was noted one, three, or six hours later. It is true that comparing animal response to human behavior is not always valid, but it makes one ponder.

The question of animal vitreous brings me to my final comment. Dr. Hill stated that he tested bovine and feline vitreous and found that they did not inhibit bacterial growth. Reed and his co-workers tested dog vitreous and rabbit vitreous, among other substances, and likewise found no self-sterilizing property.[3] The Burroughs Wellcome Laboratories have tested horse vitreous and found no antibacterial property. Thus, no animal vitreous so far tested has shown this property. Is it because animals are not getting antibiotics, because of poor penetration of antibiotics into their vitreous, or because some other factor is absent in their vitreous? In any event, during the time we had Dr. Hill's paper we tried to add the antibiotic factor to animal vitreous. Two rabbits were used. Their food was checked and found to be antibiotic free, then one eye of each rabbit was enucleated and the vitreous aspirated and stored. The rabbits were then given 400 mg. of chloromycetin subcutaneously in four injections in 21 hours and the remaining eye of each rabbit enucleated and the vitreous aspirated four hours after the last injection. This dosage represented 125 per cent of the normal human dosage of the antibiotic believed to have the best vitreous penetration. These vitreous samples were then plated against streptococci [as shown on the next slide]. Also on the slide are chloromycetin and erythromycin test discs showing by their rings of inhibition that the organism was sensitive to the antibiotic. The top two wells are rabbit vitreous before the antibiotic dosage, and show no inhibitory activity on the organism. The lower two wells are rabbit vitreous after an antibiotic overdose, but they still show no antibiotic activity. Thus, the presence of antibiotic in the donor rabbits still did not produce any antibacterial activity in the vitreous.

From all this discussion you must assume that I am a very reluctant bride to Dr. Hill's proposal, but, like the old maid, I will take it until a better proposition comes along. Again, I congratulate Dr. Hill on a well planned and well executed piece of research.

MYCOSIS FUNGOIDES WITH INTRAOCULAR INVOLVEMENT

HELENOR CAMPBELL FOERSTER
SAN FRANCISCO, CALIFORNIA

MYCOSIS fungoides is a malignant dermatosis of undetermined etiology. In its early stages the inflammatory appearance of the skin lesions has frequently led to a diagnosis of parapsoriasis, but in its later stages it becomes neoplastic in character and may involve the internal organs. Because of the reticuloendothelial origin of the tumor cells, it has been classified with the lymphomas, and like other lymphomas, the histopathologic picture may change during the course of the disease or may vary somewhat in different patients. In some instances individual lesions may be almost indistinguishable from those of reticulum cell sarcoma, but generally the over-all resemblance is closest to that of Hodgkin's disease.[2,5,6]

Lid and conjunctival involvement in mycosis fungoides is not unusual.[1,7] However, only one case, reported in Germany,[4] of pathologically proved intraocular involvement was found in the literature. Franceschetti[3] reported cotton-wool patches in the retina of a patient with mycosis fungoides, but these cleared on treatment and were regarded as the result of a retinopathy rather than as the presence of tumor cells within the eye.

From the Francis I. Proctor Foundation for Research in Ophthalmology and the Department of Ophthalmology, University of California School of Medicine.

Presented as a *Clinicopathologic Case Report* at the Sixty-Fourth Annual Session of the American Academy of Ophthalmology and Otolaryngology, Oct. 11-16, 1959, Chicago.

CASE REPORT

A 59-year-old white man developed multiple skin lesions fifteen years before his death. Biopsy of one lesion (fig. 1) showed Pautrier's "microabscesses," the subepithelial lymphocytic accumulations which are typical of early mycosis fungoides. In another specimen (fig. 2), the large reticuloendothelial cells, neoplastic in appearance and distribution, were characteristic of older lesions.

In addition to the skin disease, the patient had an enlarged prostate for which he had undergone a surgical operation with subsequent urinary infection. He had had internal hemorrhoids with bleeding, an acute gastric ulcer, blood pressure ranging from 140/90 to 190/120, and paroxysmal attacks of auricular tachycardia. He received large amounts of roentgen radiation to the skin over a period of ten years and had three courses of electron beam therapy.

Eight years before the onset of skin lesions the patient suffered a severe contusion to his left eye, producing a hyphema and iridodialysis. Vision was reduced, but the eye remained quiet for twenty-one years, when he noticed floaters and visual blur. Examination revealed vitreous opacities, cells in the anterior chamber and small keratic precipitates. Treatment consisted of corticosteroid drops and scopolamine, but a mature cataract developed and the eye became painful. One year after the onset of ocular symptoms it became neces-

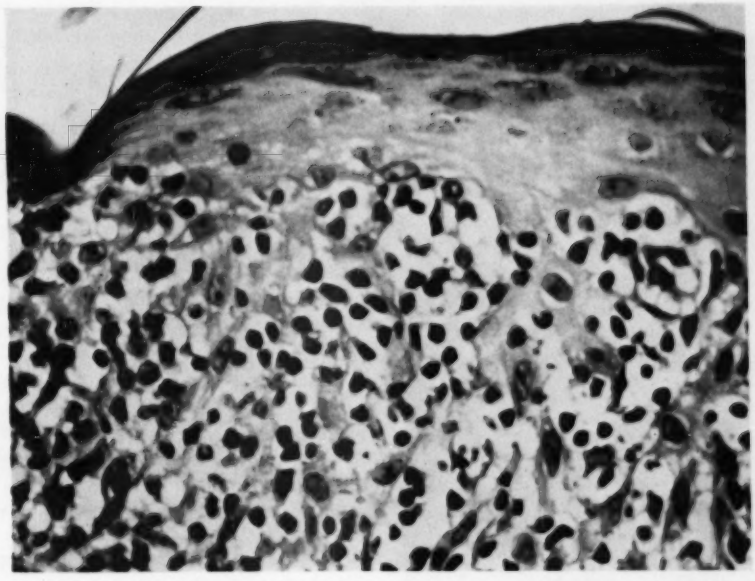

FIG. 1—Pautrier's "micro-abscesses" in skin lesion from arm, removed eleven years before death. ×700.

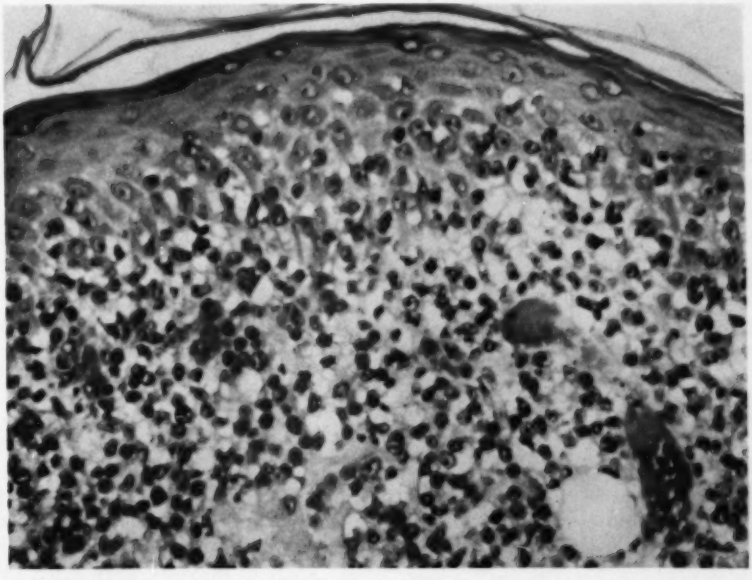

FIG. 2—Neoplastic reticuloendothelial cells in skin lesion from neck, removed eleven years before death. ×448.

sary to enucleate the eye. A clinical diagnosis of probable post-traumatic uveitis was made, although the possibility of association with his skin lesions was considered.

On gross examination the left eye measured 25x24x24 mm. The cornea was clear, the anterior chamber deep and the pupil irregular. The lens appeared swollen, cataractous and dislocated nasally and inferiorly. There was thick, white, apparently necrotic material in the vitreous chamber. A massive subretinal lesion extended around the entire posterior pole.

FIG. 3—Left eye, enucleated one year before death. Necrotic masses of tumor cells in vitreous chamber and subretinal space.

Microscopic examination of the left eye (fig. 3) showed a mild edema of the corneal epithelium. Descemet's membrane was slightly and irregularly thickened at the periphery. The endothelium was flattened, with irregularly dispersed nuclei. Macrophages, lymphocytes, plasma cells and a few polymorphonuclear leukocytes and red blood cells were present in the anterior chamber and trabecular meshwork. The iris was atrophic and sparsely infiltrated with chronic inflammatory cells. There were posterior synechias, and an inflamed pupillary membrane. On one side the lens capsule was broken beneath a coloboma of the iris root, and on this side, the zonular fibers were interrupted. A mass of necrotic cells extended from the vitreous through this opening into the posterior chamber. There was advanced degeneration of lens fibers with some calcium deposition. There were occasional chorioretinal adhesions with marked tissue atrophy. Neoplastic cells formed a diffuse layer beneath the retinal pigment epithelium, which they had invaded. In some areas, necrotic masses of these cells detached the retina. Other necrotic and hemorrhagic masses of tumor cells were present in the anterior portion of the vitreous chamber. The tumor cells which were not necrotic suggested those of reticulum cell sarcoma (fig. 4). Mitoses were rather numerous. The optic nerve appeared normal but had undergone operative trauma.

The microscopic diagnosis was intraocular involvement in mycosis fungoides.

The patient died of generalized involvement of his internal organs in the neoplastic stage of mycosis fungoides fifteen years after the onset of the skin lesion and one year after enucleation of the left eye. Sections of the skin (fig. 5), as well as of the lung, kidney, heart (fig. 6) and other organs, contained lesions composed of reticuloendothelial cells. Interspersed among these were multinucleated cells of the Reed-Sternberg type seen in Hodgkin's disease, but also sometimes observed in mycosis fungoides. Mitoses were rather numerous; areas of necrosis were often present; eosinophiles were not apparent.

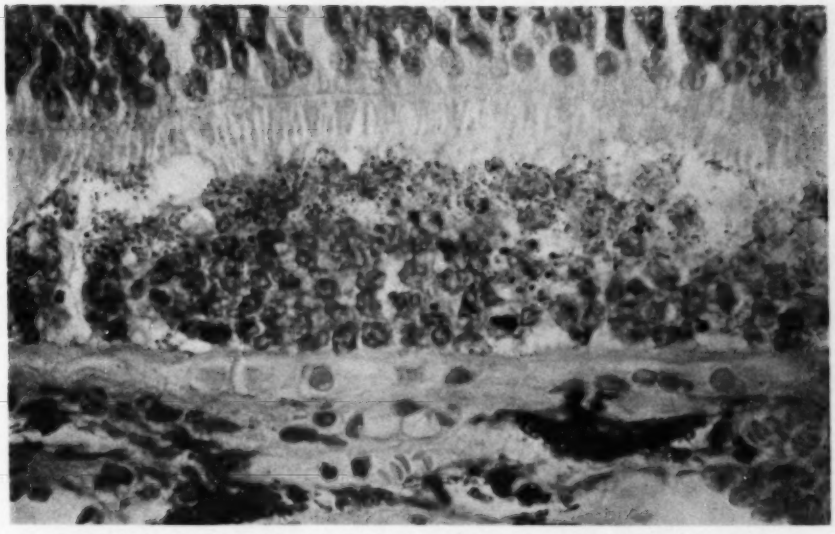

FIG. 4—Neoplastic reticuloendothelial cells beneath retinal pigment epithelium of left eye. ×1120.

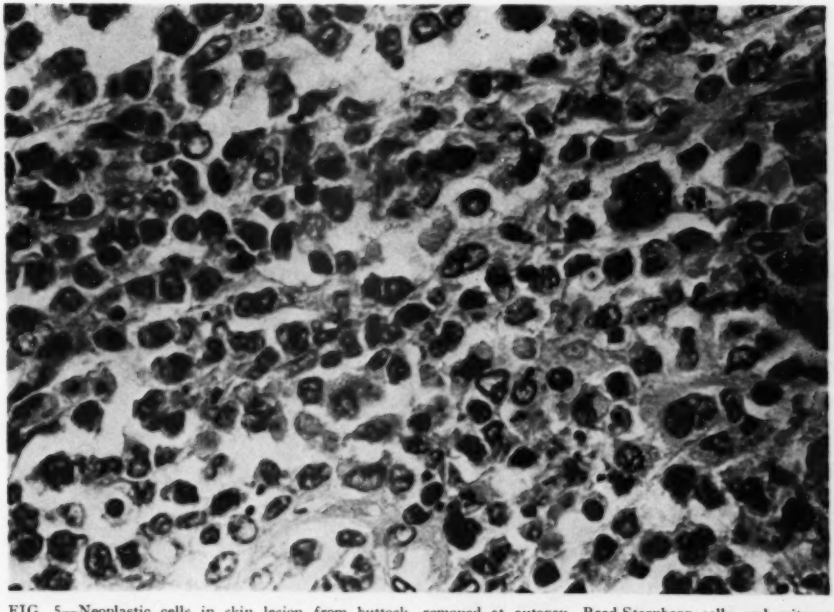

FIG. 5—Neoplastic cells in skin lesion from buttock, removed at autopsy. Reed-Sternberg cells and mitoses are present. ×1120.

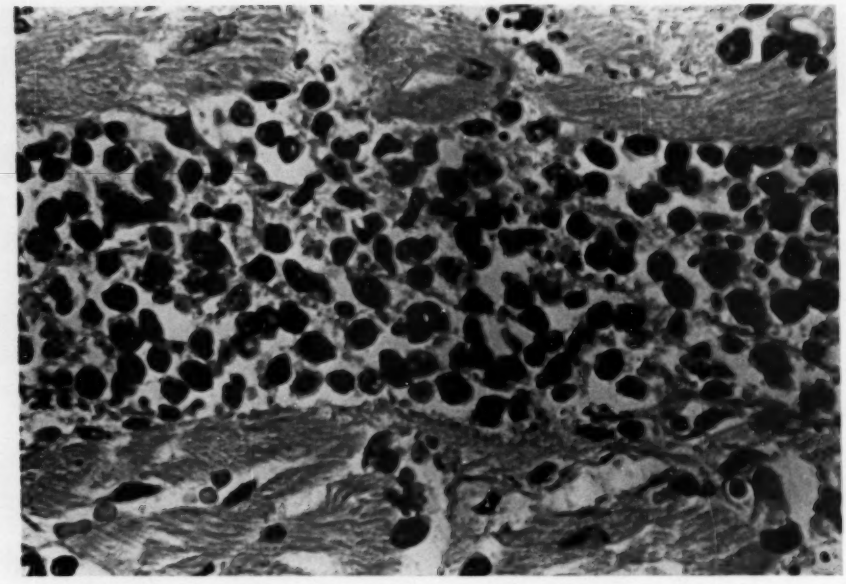

FIG. 6—Interstitial infiltration of heart muscle by immature reticuloendothelial cells. ×1120.

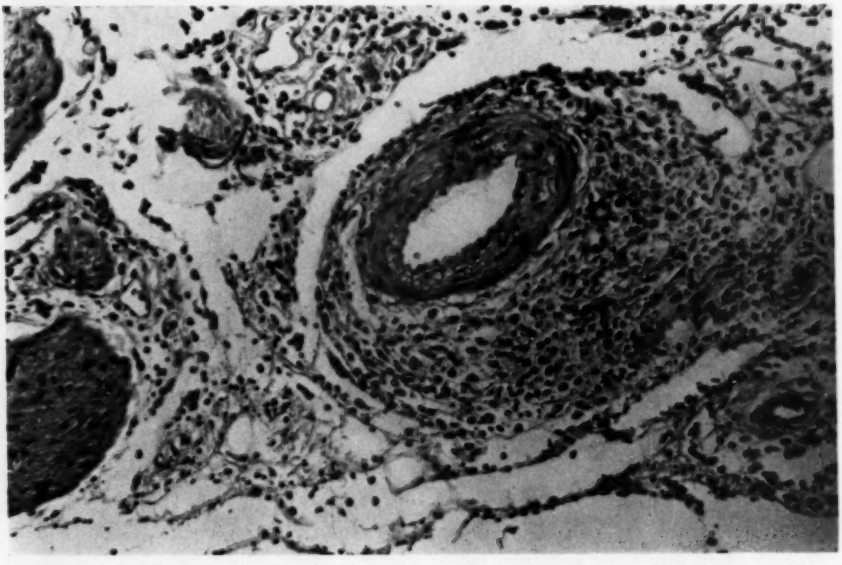

FIG. 7—Neoplastic cells around orbital nerves and vessels of right eye, removed at autopsy. ×280.

The right eye, removed at autopsy, was essentially normal, but neoplastic cells resembling those described in the disseminated lesions infiltrated the orbital tissues (fig. 7).

DISCUSSION

Ocular involvement in tumors of the leukopoietic system is not unusual. It has been observed in lymphosarcoma, reticulum cell sarcoma and, with moderate frequency, in the leukemias. In the case presented, involvement of the inner eye in mycosis fungoides is of particular interest not only because of its rarity but because, on the basis of previous injury and ophthalmoscopic and slit lamp examination, it was suspected clinically of being uveitis, unrelated to the general disease.

ACKNOWLEDGMENTS

The publication of this case has been made possible by the generous contributions of clinical data and pathologic material by Dr. G. B. Robson of the Lahey Clinic, and by Dr. William J. Ferguson, Jr., Dr. Eugene M. Farber and Dr. Barbara von Schmidt of the Stanford University School of Medicine.

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COMBINATION PILLAR AND PALATE RETRACTOR

L. Reed Cranmer, M.D.
TOLEDO, OHIO

I would like to present a combination pillar and palate retractor which I have found will greatly facilitate tonsil and adenoid surgery. Rather than an entirely original instrument, it should be considered as a combination, a modification and, I believe, an improvement of older patterns.

Basically it provides a single instrument for the surgeon, anesthetist, or assistant to use for providing the best possible exposure of the tonsil fossa or nasopharynx while imparting efficiency by minimizing the handling and exchange of instruments (figs. 1, 2, and 3).

The 135-degree center angle makes possible a clear field of vision, unobstructed by the fingers of the assistant, in examination of either area. The flat, wide, finely ridged shaft near the angle provides a secure grip. The entire surface of the instrument is provided with a dull velvet finish to eliminate the glare of reflected light.

Presented as a *New Instrument* at the Sixty-Fourth Annual Session of the American Academy of Ophthalmology and Otolaryngology, Oct. 11-16, 1959, Chicago.

The pillar retractor resembles the Hurd instrument but is larger in all dimensions to expose almost the entire tonsil fossa at a glance, and to prevent the annoyance of its slipping off the anterior pillar during ligation of vessels. The instrument near the angle acts as a bite block in patients who are over premedicated under local anesthesia or under light general anesthesia.

The palate retractor end is curved both in the direction of the length and width of the instrument. Its size and shape allow about 20 per cent more visualization of the nasopharynx than other instruments studied. It is equally useful in the infant or adult for a careful direct-vision adenoidectomy, so a variety of different sizes is unnecessary. It may also be used as a tongue depressor, and it furnishes a stable and comfortable handle when using the pillar retractor, since it curves around the dorsal surface of the first digit of the index finger.

Acknowledgment is made to the Storz Instrument Company, which kindly collaborated in making the instrument.

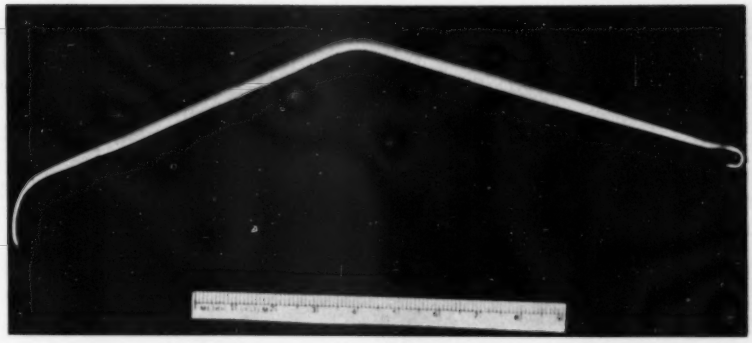

FIG. 1—Side View

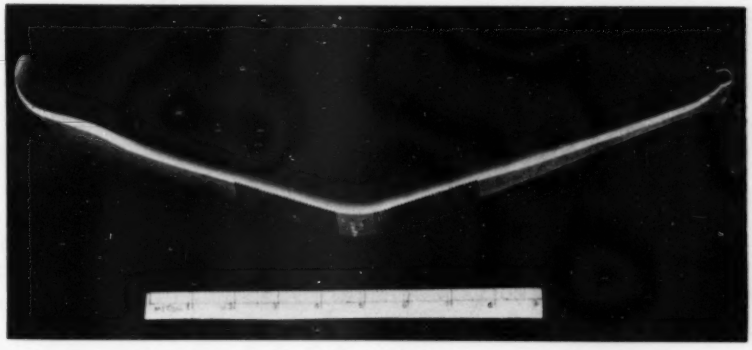

FIG. 2—Back View

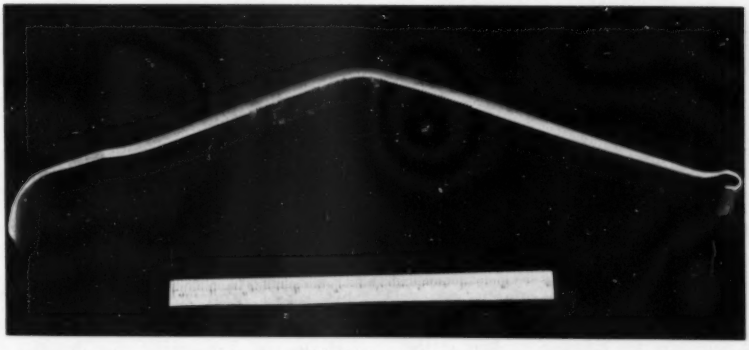

FIG. 3—Front View

EAR INSTRUMENTS FOR OFFICE USE WITH MAGNIFICATION

DONALD A. CORGILL, M.D.
DALLAS, TEXAS

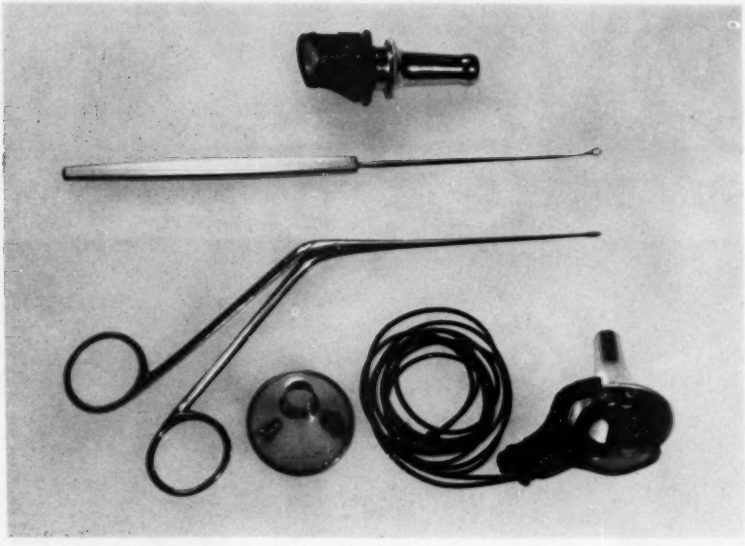

FIGURE 1.

IN the new era of microscopic reconstructive ear surgery, the use of magnification in surgery becomes mandatory. It follows naturally that office examination and treatment now also require magnification to determine the exact location of visible disease, the presence or absence of thin membranous healing, to observe the effect of application of small positive and negative air pressures, to apply vibrating testing equipment and, finally, to cauterize, or to place diagnostic patches. Especially needful are those of us who were farsighted to begin with and others who are now in the presbyopic age group. Light requirement increases approximately 100 per cent between the residency age group and the presbyopic age group. Magnification increases visibility.

It was found that available instruments were too short to use comfortably with the usual magnification devices (fig. 1). Their handles impinge on the mag-

*Manufactured by the Storz Instrument Company, 4570 Audubon Ave., St. Louis.

Presented as a *New Instrument* at the Sixty-Fourth Annual Session of the American Academy of Ophthalmology and Otolaryngology, Oct. 11-16, 1959, Chicago.

nifying glass, forcing one to turn the magnifier and to use the less deft opposite hand as the instrument manipulator. It was a simple matter to increase the length and delicacy of two commonly used instruments.* The Hartman-type forceps was selected because of the simple construction of its joint, which is believed to resist sterilization damage for a longer time than more complicated ones. These instruments have been in service in our department for more than a year and have proved to be quite satisfactory.

A SIMPLIFIED SELF-RETAINING RETRACTOR FOR MIDDLE EAR SURGERY

GORDON H. SCOTT, M.D.
CHICAGO, ILLINOIS

THIS is a bivalve ear speculum, with a small retractable hook which is to be inserted under the bridge of the aditus and secured in position with a setscrew. This fixes the instrument posterosuperiorly. The anteroinferior blade of the speculum is longer than the other, and is corrugated to prevent slippage.

The drum is first retracted in the usual manner, and bone work is performed on the bony annulus. The instrument is then inserted in the closed position; the hook is engaged under the bridge and fixed with the setscrew. The jaws of the instrument are then opened, fixing the instrument firmly in place.

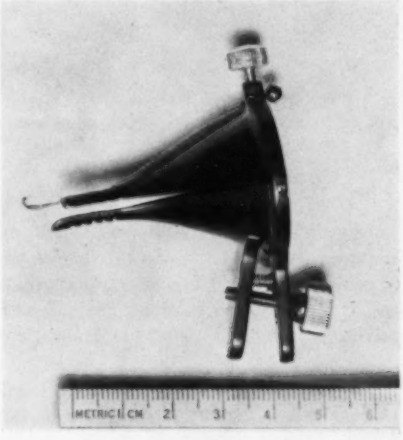

FIGURE 1.

Presented as a *New Instrument* at the Sixty-Fourth Annual Session of the American Academy of Ophthalmology and Otolaryngology, Oct. 11-16, 1959, Chicago.

EXTRACTION LOOP FOR SMALL LENSES

ALSTON CALLAHAN, M.D.
BIRMINGHAM, ALABAMA

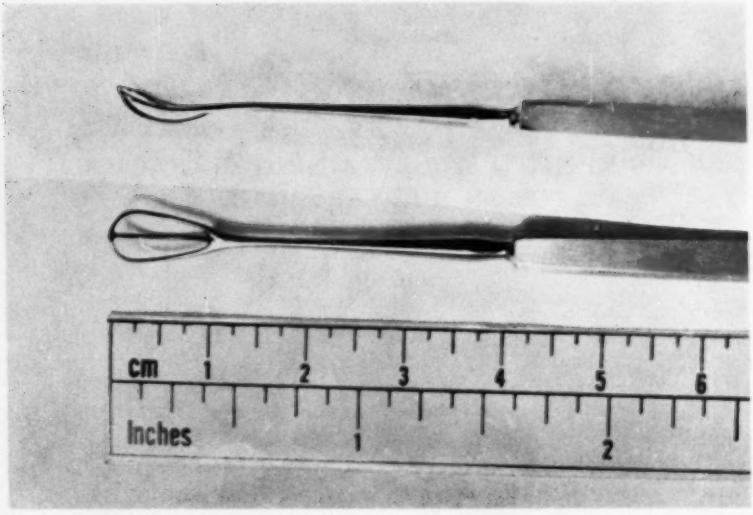

FIG. 1—Extraction loop for small lenses.

IN removing small lenses, such as some of those of congenital origin, or in removing the nucleus of a morgagnian cataract, the capsule of which has ruptured, the opening in the loop may permit the lens or nucleus to slip through as the maneuver of extraction is performed. To prevent this embarrassing complication, the loop has been designed with a central wire, bent at the same curve as that of the posterior lens surface. When the lens is "netted" with this instrument, it is not possible for it to slide off, as it might if the central wire were on the same level with the loop.

Presented as a *New Instrument* at the Sixty-Fourth Annual Session of the American Academy of Ophthalmology and Otolaryngology, Oct. 11-16, 1959, Chicago.

TRANSACTIONS

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AMERICAN ORTHOPTIC JOURNAL

Ten years ago the American Orthoptic Council and the American Association of Orthoptic Technicians held a joint scientific session during the week of the Academy meeting in Chicago. Papers read at that meeting were published in a special production called the AMERICAN ORTHOPTIC JOURNAL. Papers read at previous joint sessions had been included in the TRANSACTIONS of the Academy and these sessions had been considered as special events in the regular Academy program. Since 1950 the papers read at the annual meeting of the American Association of Orthoptic Technicians have been published by the Academy as part of the AMERICAN ORTHOPTIC JOURNAL, and for several years the JOURNAL was mailed to each member of the Academy as a supplement to the TRANSACTIONS.

After a few years it became apparent that members not practicing ophthalmology were not interested in the JOURNAL. How many ophthalmologists were interested in the JOURNAL was a question. A mail inquiry was sent to each member of the Academy asking whether he chose to have his name remain on the JOURNAL mailing list. The result of that ballot is the basis for the present circulation. Each year the members of the Academy are asked to indicate by mail whether they wish to receive *free* the AMERICAN ORTHOPTIC JOURNAL as a supplement to the TRANSACTIONS.

The 1960 number, volume 10, has just been released. It was mailed *free* to 2,140 members of the Academy and to 192 libraries and exchanges. Each member of the American Association of Orthoptic Technicians pays a subscription fee of $2.00, which is included in the Association dues and remitted by the Treasurer. An additional 35 subscribers pay the regular subscription price. Free copies were sent to ophthalmologic institutions in Mexico City. A total of 2,637 copies were mailed.

On the date of mailing the JOURNAL, April 23, 1960, there were 6,888 members of the Academy who could receive

the JOURNAL *free* if they wanted it. While it is presumed that only ophthalmologists would want it, we have no such classification of Academy membership; if we had such a classification, we would not refuse to send the JOURNAL to any active member who asked for it.

The Orthoptic Council is composed of nominees from the American Ophthalmological Society, the American Medical Association, the American College of Surgeons, and the American Academy of Ophthalmology and Otolaryngology. Annual meetings have been held during the Academy week. The Academy has assisted in making arrangements for the joint meeting with the American Association of Orthoptic Technicians and has shared the cost of the meeting hall. The Academy has fostered the orthoptic movement in a number of ways not shared by the other sponsoring organizations. The cost of printing the JOURNAL is borne entirely by the Academy as a contribution to the effort of those ophthalmologists who continue to develop the field and keep visual orthoptics in the medical profession where it belongs.

Volume 10, 190 pages in all, contains two important symposia: (1) Pleoptics in the Treatment of Strabismus, and (2) Illumination and Its Relationship to Visual Acuity and Oculomotor Function. In addition to these instructive studies there are sixteen papers on subjects of interest to all ophthalmologists and orthoptic technicians, in fact, to all persons who are occupied in the field of vision. *Pleoptics* is a new term for a new concept of a familiar situation. It belongs in the category of orthoptics. In it are new instruments, the names of which are so new that they do not appear in the medical dictionaries. How many of us can describe offhand the Visuscope, the Euthyscope, the Pleoptophor and Coordinator and demonstrate their functions and evaluate their usefulness? Will this new project receive the attention it deserves in the offices of ophthalmologists or will we brush it aside until another group dominates the field, as we have seen happen in some other phases of eye care? Is the treatment of strabismus and amblyopia the sole privilege of the ophthalmologist? If the ophthalmologist drags his feet in the race for better methods through research and scientific achievements, how can he howl so loudly when some other group forges ahead?

The Academy has nourished and encouraged "orthoptics" and that service has remained within the fold. More than a token interest will be necessary to keep it there.

W.L.B.

In Memoriam

GEORGE MORRISON COATES

1874 - 1960

GEORGE MORRISON COATES

1874 - 1960

George Morrison Coates, Past President and Honorary Fellow of the American Academy of Ophthalmology and Otolaryngology, was born in Philadelphia, Pennsylvania, on March 24, 1874, and died at West Whiteland, Chester County, Pennsylvania, on February 7, 1960, at the age of 86 years.

He received the degree of Doctor of Medicine from the University of Pennsylvania in 1897. Following internship at the Pennsylvania Hospital, Dr. Coates engaged in the postgraduate study of otolaryngology at the Philadelphia Polyclinic and College for Medical Graduates, where he became associate professor in 1905. From 1919 to 1954, he was professor of otolaryngology and chief of service at the Graduate School of Medicine of the University of Pennsylvania. He served as chairman and professor of otolaryngology at the School of Medicine of the University of Pennsylvania and chief of service at the Hospital of the University of Pennsylvania from 1934 to 1939.

Dr. Coates was certified by the American Board of Otolaryngology in 1925, becoming a member of the Board in 1930, and later senior consultant. He was a past president of the American Laryngological Association, the American Otological Society, the American Laryngological, Rhinological and Otological Society, the American Academy of Ophthalmology and Otolaryngology, and the Philadelphia Laryngological Society. He was a corresponding fellow of the Societé de Laryngologie des Hôpitaux de Paris and a fellow of the American Bronchoesophagological Association, the College of Physicians of Philadelphia, the American Society of Immunologists, the American College of Surgeons, and the Pacific Coast Oto-Ophthalmological Society.

He was chairman of the Section of Laryngology, Otology and Rhinology of the American Medical Association in 1927; chairman of the ear, nose and throat section of the Pennsylvania Medical Society in 1921; chairman of the ear, nose and throat section of the Clinical Congress of Surgeons of North America from 1921 to 1936, and chairman of the ear, nose and throat section of the College of Physicians of Philadelphia from 1928 to 1930.

Dr. Coates was editor-in-chief of the A.M.A. Archives of Otolaryngology from 1937 to the time of his death; co-editor with Dr. Chevalier Jackson of "The Nose, Throat and Ear and Their Diseases" (1929); co-editor with Dr. I. S. Ravdin of the American edition of "Kirschner's Operative Surgery" (1937), and editor of the five-volume "Otolaryngology" (1955). He was the recipient of the Newcomb Award of the American Laryngological Association in 1943; of the De Roaldes Gold Medal in 1949; of the Award of Merit of the American Academy of Ophthal-

mology and Otolaryngology in 1946, and of the Gold Medal Award of the American Otological Society in 1949.

Dr. Coates served as Assistant Surgeon in the United States Navy during the Spanish-American War; as First Lieutenant to Lieutenant Colonel in the Medical Corps of the Pennsylvania National Guard from 1900 to 1916, and as Major to Colonel, MC, United States Army, from 1917 to 1919. During World War I, he was chief of the section of head surgery at base hospitals in Camp Sevier, South Carolina, and Camp Hancock, Georgia; commanding officer of Base Hospital 56, Allerey, France; otolaryngologist to the Embarkation Center, Bordeaux, France, and President of the Reclassification Board.

A daughter, a brother, and two sisters survive.

In Memoriam

George Eli Adkins.....Jackson, Mississippi
January 13, 1960

Edwin Clarence Bach.....Milwaukee, Wisconsin
February 7, 1960

Hans Barkan.....San Francisco, California
March 7, 1960

Luther F. Beetem.....Madison, Indiana
January 26, 1960

Lynwood Kent Best.....Charleston, South Carolina
January 19, 1960

William H. Braunlin.....Marion, Indiana
December 22, 1959

Austin F. Burdick.....Grand Ledge, Michigan
January 4, 1960

Harold James Cannon.....Milwaukee, Wisconsin
January 29, 1960

Lloyd H. Clark.....Penfield, New York
December 24, 1959

George M. Coates.....Philadelphia, Pennsylvania
February 7, 1960

Claude Carr Cody, Jr.....Houston, Texas
December 30, 1959

Frank Garrett Folken.....Albert Lea, Minnesota
January 31, 1960

Emmette Trible Gatewood.....Richmond, Virginia
January 5, 1960

In Memoriam

Robert Henner.....Chicago, Illinois
January 21, 1960

Robert Budd Karkeet.....Portland, Oregon
January 22, 1960

Mercer G. Lynch.....New Orleans, Louisiana
February 9, 1960

Gordon J. McCurdy.....Phoenix, Arizona
February 14, 1960

John Boyd McMurray.....Washington, Pennsylvania
February 18, 1960

Forest Wayne Merica.....Lakewood, Ohio
December 2, 1959

Maurice Elias Mesirow.....San Francisco, California
January 29, 1960

Wade H. Miller.....Kansas City, Missouri
February 13, 1960

William C. Posey, Jr.....Bryn Mawr, Pennsylvania
January 2, 1960

Harley W. Qualls.....Memphis, Tennessee
October 28, 1959

Charles E. Savery.....Deerfield Beach, Florida
February 13, 1960

Frank Carlton Smith.....Charlotte, North Carolina
February 25, 1960

Arthur James Wagers.....Philadelphia, Pennsylvania
December 18, 1959

LISTING OF AUDIOMETERS

The following audiometers are recommended for listing as of December 15, 1959:

PURE TONE AUDIOMETERS

Beltone Model 10-C Model 15-C	Beltone Hearing Aid Company Audiometer Division 2900 West 36th Street Chicago 32, Illinois
Maico Model MA-5 Model H1-B for pure tones only	Maico Electronics Inc. Maico Building 21 North Third Street Minneapolis 1, Minnesota
Sonotone Model 91	Sonotone Corporation Elmsford, New York

SPEECH AUDIOMETERS

Grayson-Stadler Model 162	Grayson-Stadler Co. West Concord, Massachusetts

SCREENING AUDIOMETERS

Ambco Otometer 600	Ambco Inc. 1222 W. Washington Blvd. Los Angeles 7, California

Each model number in the list as a rule indicates the most advanced model of that series. If less advanced instruments are for sale under similar model numbers, it is assumed that they will function as well or better than the more complicated model in a series.

Acceptance for listing means that the audiometer manufacturer has demonstrated the ability to produce one instrument that performs according to A.S.A. specification. It does not imply that any individual instrument will perform within the tolerances. It is obviously beyond the scope of the Listing Committee or the Referee Laboratories to provide production control for audiometer manufacturers and their customers; however, listing does indicate that the product of the manufacturer can come up to 1951 A.S.A. specifications, and it is up to the customer to carry on negotiation with the manufacturer if a particular instrument which he receives is faulty.

Abstracted from the 1959 Report of the Listing of Audiometers Subcommittee of the American Academy of Ophthalmology and Otolaryngology Committee on Conservation of Hearing.

SECTION ON INSTRUCTION

* * *

SIXTY-FIFTH ANNUAL MEETING

American Academy of Ophthalmology and Otolaryngology

October 9-14, 1960

PALMER HOUSE

Chicago, Illinois

A. D. RUEDEMANN, M.D.
Secretary for Instruction — Ophthalmology

EUGENE L. DERLACKI, M.D.
Secretary for Instruction — Otolaryngology and Maxillofacial Surgery

This Section presents for 1960:

Ophthalmology: 168 Individual Courses; 56 Continuous Courses. The faculty is comprised of 278 instructors, and the hours of instruction total 394.

Otolaryngology: 113 Individual Courses; 22 Continuous Courses and Panel Discussions. The faculty is comprised of 148 instructors and the total number of instruction hours is 180.

An *individual* course is complete in one (1) period. A *continuous* course runs two (2) or more periods as indicated. It is not possible to purchase a ticket to only *part* of a continuous course. Some courses are repeated on different days allowing the subscriber to choose the time when he wishes to attend.

Ordering Instruction Tickets

Only members who have paid their 1960 dues may order instruction tickets in advance of the meeting. **Members should order tickets only for their own use.** *Candidates for fellowship in the Academy are not privileged to reserve tickets in advance.* After the session opens, no distinction between members, candidates and guests will be made in selling tickets.

At the end of this section is printed a colored sheet to be used when ordering tickets in advance. Specify preferences on this sheet and mail to the executive office. Careful attention to instructions will ensure the correct filling of your requests. *Since number of tickets for each course is limited, be sure to list second and third choices for each period in case first choice is already sold out. In every case, effort will be made to furnish first choices.*

If you are requesting registration in the continuous courses, please specify preferences for individual courses as substitutes in order to avoid disappointment should the continuous courses which you select be sold out when your order is received.

Each period (1 hour) of instruction costs $2.00. *Orders not accompanied by properly executed checks will not be filled.* Checks should be made payable to W. L. Benedict, M.D., and mailed to the Academy office, 15 Second St. S.W., Rochester, Minn.

All orders for tickets will be filled according to the postmark on the envelope containing the check. Telegrams will not be honored. Orders will not be accepted for presale after September 29; to ensure acceptance they should be mailed before September 27.

Acknowledgment of Advance Order

As soon as an advance order is filled, a post card, listing the courses that have been reserved for him, will be mailed to the subscriber. Please do not ask to change courses after your order has been filled. The post card is merely an assurance that your order has been filled; it is not necessary for registration at the Academy meeting.

Claiming Instruction Tickets

No tickets will be sent through the mails. Members who have ordered instruction course tickets will register at the *Advance Order Section* of the Registration Desk during the week of the Convention to secure registration badge, tickets, and all convention material.

Tickets will be on sale during the meeting at the Instruction Desk in the Registration Foyer and the Seventh Floor.

Refunds

If courses requested are not available and it is impossible to substitute, a refund will be granted. A blue refund card will be placed in the Advance Registration Envelope which is received at the time of registration. This may be presented at the Instruction Desk for payment.

In case of inability to attend the meeting after order has been filled, a refund will be granted if requested prior to October 7.

If you have ordered tickets in advance, at the time of registration take your registration card to the desk marked ADVANCE ORDERS. There you will be given an envelope containing badge, tickets and program which has been prepared ahead of time to facilitate your registration.

KEY TO DESIGNATION OF PERIODS

The periods will be designated with the following key: Select tickets for — Otolaryngology, forenoons, periods 1-2-3 — Ophthalmology, afternoons, periods 4-5-6

Day	(M)onday	(T)uesday	(W)ednesday	(Th)ursday
Period a.m.		1 2 3	1 2 3	1 2 3
Period p.m.	4 5 6	4 5 6	4 5 6	4 5 6

M-4	2:00 p.m. to 3:00 p.m.	W-4	2:00 p.m. to 3:00 p.m.
M-5	3:15 p.m. to 4:15 p.m.	W-5	3:15 p.m. to 4:15 p.m.
M-6	4:30 p.m. to 5:30 p.m.	W-6	4:30 p.m. to 5:30 p.m.
T-1	9:00 a.m. to 10:00 a.m.	Th-1	9:00 a.m. to 10:00 a.m.
T-2	10:15 a.m. to 11:15 a.m.	Th-2	10:15 a.m. to 11:15 a.m.
T-3	11:30 a.m. to 12:30 p.m.	Th-3	11:30 a.m. to 12:30 p.m.
T-4	2:00 p.m. to 3:00 p.m.	Th-4	2:00 p.m. to 3:00 p.m.
T-5	3:15 p.m. to 4:15 p.m.	Th-5	3:15 p.m. to 4:15 p.m.
T-6	4:30 p.m. to 5:30 p.m.	Th-6	4:30 p.m. to 5:30 p.m.
W-1	9:00 a.m. to 10:00 a.m.		
W-2	10:15 a.m. to 11:15 a.m.		
W-3	11:30 a.m. to 12:30 p.m.		

(Familiarity with this key will be helpful and will avoid confusion)

1960

CONTINUOUS COURSES — OPHTHALMOLOGY

COURSE 1

Room 738 Periods M-4, M-5, T-4, T-5, W-4, W-5, Th-4, Th-5

JAMES H. ALLEN, M.D., et al

Bacteriology and Infectious Diseases of the Eye

An eight-period course—$16.00

The first hour of the course will be devoted to bacteriology and methods of etiologic diagnosis of infectious diseases. Six hours will be devoted to the clinical manifestations and differential diagnosis of infectious and allergic diseases of the eye, and one hour will be devoted to a general summary of the therapy of infectious diseases.

M-4—Bacteriology
Ted Suie, Ph.D.
Columbus, Ohio
BY INVITATION

M-5—Infections of the Lids and Lacrimal Apparatus
Alson E. Braley, M.D.
Iowa City

T-4—Bacterial Infections of the Conjunctiva
James H. Allen, M.D.
New Orleans

T-5—Allergic Diseases of the Lids, Conjunctiva, and Cornea
Frederick H. Theodore, M.D.
New York

W-4—Infectious Diseases of the Cornea
Henry F. Allen, M.D.
Boston

W-5—Virus Infections of the Lids and Conjunctiva
Samuel J. Kimura, M.D.
Berkeley, Calif.

Th-4—Infections of the Orbit and Globe (to include surgical infections)
Gustav C. Bahn, M.D.
New Orleans

Th-5—Therapy of Infectious Diseases
James H. Allen, M.D.
New Orleans

COURSE 2

Room 713 Periods M-4, M-5

KARL W. ASCHER, M.D.
Cincinnati

Aqueous Veins in Glaucoma

A two-period course—$4.00

The aqueous veins are biomicroscopically visible pathways similar to blood vessels in appearance, containing clear, colorless fluid or diluted blood or both, and intercalated, via Schlemm's canal, between intraocular fluid and conjunctival or episcleral veins.

The detection, in 1941, of the aqueous veins confirmed the presence of a continuous elimination—and therefore production—of aqueous humor, resolving a controversy of decades and opening up new approaches to glaucoma research. The physiologic implications of these structures have been verified by numerous investigators in studies on man and animals. The control of flow appears to reside within the roots of the aqueous veins, deep in the scleral tissue, with a regulating center which is probably located in the diencephalohypophyseal area. The trabeculae also play a role.

The qualities of the aqueous veins and their bearing on the retention theory and the neurovascular theory of glaucoma will be discussed. A motion picture will be shown.

COURSE 3

Room 706 Periods W-5, W-6

ELMER J. BALLINTINE, M.D.
Cleveland
and
E. PURNELL, M.D.
Euclid, Ohio
BY INVITATION

Clinical Tonography

A two-period course—$4.00

The value of tonography as a practical clinical office procedure in the manage-

ment of glaucoma has been established. The clinical procedure and the more common sources of errors will be demonstrated in a motion picture and discussed in sufficient detail that the observers will be able to perform the test or instruct their technicians in the procedure.

Most of the time will be spent in interpretation and discussion of tonographic data obtained in the following clinical situations:

1. Early diagnosis of glaucoma
2. Refinement of provocative tests
3. Anticipation of failure of medical therapy before field loss occurs
4. Anticipation of failure of previously successful antiglaucoma surgery
5. "Low-tension glaucoma" as a result of
   (a) decreased scleral rigidity
   (b) "arrested" glaucoma
   (c) cavernous atrophy of the nerve and related concepts

COURSE 4

Room 713 Periods T-4, T-5

BERNARD BECKER, M.D.
St. Louis

V. EVERETT KINSEY, Ph.D.
Detroit

Studies of Aqueous Flow

A two-period course—$4.00

Current concepts of the composition of the aqueous humor and the manner of its formation will be presented.

The rate of aqueous secretion will be discussed from the point of view of methods of measurement and induced alterations.

COURSE 5

Room 734 Periods M-4, T-4, W-4

ARTHUR J. BEDELL, M.D.
Albany, N. Y.

Ophthalmoscopy

A three-period course—$6.00

Kodachrome demonstrations with hundreds of photographs in a comprehensive review.

Normal variations, anomalies and unique patterns.

Circulatory alterations including sudden arterial or vena occlusions with serial studies. The retinopathy found in diabetes, the hypertensive state, and arteriosclerosis. The blood dyscrasias, tuberculosis and syphilis.

The optic nerve diseases; emphasis on the differentiation between edema, choked disc, infection, and optic neuritis.

Senile macular degeneration from the earliest signs to terminal scars.

COURSE 6

Room 722 Periods M-6, T-6, W-6

MILTON L. BERLINER, M.D.
New York

Recent Advances in Biomicroscopy

A three-period course—$6.00

COURSE 7

Room 702 Periods Th-4, Th-5

PAUL BOEDER, Ph.D.
Iowa City

Practical Optics

A two-period course—$4.00

The optical properties and practical aspects of single vision and contact lenses as well as of all types of multifocal lenses will be discussed: in particular, their defects and prismatic effects, such as object displacement, image jump, vertical imbalances, and decentration. This will be followed by a discussion of cataract and telescopic lenses, and finally, by a review of the optical principles of retinoscopy, and direct and indirect ophthalmoscopy.

COURSE 8

Room 713 Periods W-5, W-6

ALSON E. BRALEY, M.D.
Iowa City

Fundus Lesions:
Diagnosis with Slit Lamp

A two-period course—$4.00

Examination of the fundus and vitreous with the slit lamp is an aid to diagnosis. In order to see the fundus, the Hruby lens or a special contact lens is necessary. A thin contact lens allows the examiner to swing the slit lamp beam over a wide range when compared to the Hruby lens. The contact lens also gives the observer better stereoptic view of all the deep structures. The normal eye and pathologic eye examined with the slit lamp and contact lens demonstrates many a new observation and aid to the ophthalmologist.

COURSE 9

Room 711 Periods M-4, M-5 and T-4 or T-5 or T-6

ROBERT J. BROCKHURST, M.D.
CHARLES D. J. REGAN, M.D.
Boston

Indirect Ophthalmoscopy

A three-period course—$6.00

This course will be divided into two parts. The first part will be a two-hour lecture on the technique and applications of indirect ophthalmoscopy. Slides of fundus paintings and a motion picture will be used to amplify the lecture material. The second part will be a one hour session in which each student will examine rubber eyes using the stereoscopic indirect ophthalmoscope.

The course will be limited to 36 students. All 36 students will attend the opening two-hour lecture. The class will then be divided into three groups, with 12 students in each group. Each group will meet for one hour on the following day, when each student will have the use of an indirect ophthalmoscope and an assortment of simulated eyes with which to practice. When ordering tickets, please indicate whether you wish to attend during the fourth, fifth, or sixth period on Tuesday.

COURSE 10

Room 795 Periods M-4, M-5, T-4, T-5, W-4, W-5, Th-4, Th-5

HAROLD W. BROWN, M.D., et al

Eye Muscles

An eight-period course—$16.00

M-4 & 5—Physiology and Pathology of the Ocular Muscles

Harold W. Brown, M.D.
New York

The physiologic action of the individual muscles in conjugate and disjunctive movements (convergence, divergence) will be discussed and illustrated. From these normal physiologic acts, the pathologic variations will be developed and classified. Various methods of diagnosis, measurement of deviations, and the surgical and nonsurgical correction of these deviations will be presented.

T-4 & 5—Congenital Anomalies

Rudolf Aebli, M.D.
New York

The subject matter will cover the more usual congenital anomalies such as retraction syndrome and its variations, strabismus fixus, Marcus Gunn jaw-winking syndrome, paralyses of both elevators of one eye with true ptosis and pseudoptosis, and also congenital individual muscle anomalies. Differential diagnosis and treatment, if any, will be discussed.

W-4—Tests

Paul T. McAlpine, M.D.
Summit, N. J.

Tests in common use will be briefly described and the relative merits discussed. Emphasis will be placed on the screen cover test and its modifications. A practical routine muscle test will be outlined, and the technique of the various procedures will be described in detail.

W-5—Surgical Techniques in the Management of Motor Anomalies

William B. Clark, M.D.
New Orleans

The anatomy of the extraocular muscles with their fascial attachments will

be briefly discussed. Techniques of the various operations on the extraocular muscles will be presented in detail.

Th-4 & 5—Surgery of the Extraocular Muscles

Harold W. Brown, M.D.
Rudolf Aebli, M.D.

The indications and contraindications for surgical correction of heterophoria and heterotropia will be discussed. Special emphasis will be placed on the methods used in selecting the proper muscle or muscles for operation and the amount of correction that can be expected from the different types of surgical procedures.

COURSE 11

Room 715 Periods T-5, T-6

VICTOR A. BYRNES, M.D.
St. Petersburg, Fla.

Ophthalmic Filters

A two-period course—$4.00

In prescribing sunglasses or tinted lenses the following factors should be considered:

a. In what kind of light will these filters be used?

b. What effects do these light wavelengths have on the eye if unfiltered?

c. What effects do the various filters have on the light distribution?

d. What is the effect on vision of the changes in the light reaching the eye?

These factors will be discussed. Other topics for discussion will include sunglasses of different shades and the advantages and disadvantages of each; tinted lenses for constant wear; types of tinted lenses advocated for night driving and their defects; tinted windshields and their transmission curves, uses and disadvantages; reflecting filters and their uses; relative merits of glass and plastic lenses; use of sunglasses with corrections for refractive errors; strength of corrections which can be ground in large-size sunglass lenses; polarizing lenses; shooting glasses; defects of clip-on lenses; filters for possible use in prevention of intraocular damage by atomic flash and other high intensity radiation.

COURSE 12

Room 752 Periods M-5, M-6, T-5 T-6, W-5, W-6, Th-5, Th-6

ALSTON CALLAHAN, M.D., et al

Ophthalmic Plastic Surgery: Advanced

An eight-period course—$16.00

This course is designed for those who are well acquainted with the fundamentals of ophthalmic plastic surgery, and who have had some experience in this field. It is recommeded that the Fundamental Course be taken as a prerequisite. (See Hughes et al, Course 21.)

M-5—Conjunctival Surgery

Alston Callahan, M.D.
Birmingham, Ala.

Methods for combating recurrent pterygiums. Repair of socket deformities, reconstruction of lower fornix, reconstruction of entire socket. Conjunctival grafts necessary in repair after burns, symblepharon, trachoma.

M-6—Congenital Abnormalities and Canthoplasty

Edmund B. Spaeth, M.D.
Philadelphia

This discussion will include such congenital anomalies as coloboma of the lid, epicanthus, blepharophimosis, congenital entropion and epiblepharon. Surgery of the canthus after injury and disease, in early and late repair will be illustrated.

T-5—Ptosis

Charles Iliff, M.D.
Baltimore

Correction of ptosis by the techniques of Berke, Johnson, Crawford, and Schimek will be outlined. Basic concepts will be presented. The methods best for various types of cases will be discussed.

T-6—Repair of Ectropion

Merrill J. Reeh, M.D.
Portland, Ore.

The senile, paralytic, spastic and cicatricial types of ectropion will be considered. The indications for surgical repair, techniques, postoperative care, and end results will be demonstrated with kodachrome slides and drawings.

W-5—Repair of Lacrimal Abnormalities

Crowell Beard, M.D.
San Jose, Calif.

Malfunctions of the lacrimal gland, puncta, canaliculi, sac and nasolacrimal duct will be considered. The best method of restitution of the function of these structures will be described.

W-6—Reconstruction of the Lid

Alston Callahan, M.D.

An outline for the best procedure for reconstruction of various portions of each lid will be presented. Drawings will be used to illustrate how reconstruction can be best accomplished. Cases of loss of the lower lid, of the upper lid, and of both lids will be shown to illustrate the techniques available. A new method of applying a free skin graft to a newly reconstructed posterior lamina of conjunctiva and muscle will be shown.

Th-5—Repair of Fractures of the Orbit

Byron Smith, M.D.
New York

The mechanism of fractures of the orbit will be correlated with the signs and symptoms diagnostic of the condition.

An outline of the advocated procedures will be discussed in detail. Reduction of early fractures will be demonstrated by a motion picture. The sequence and technique of late fracture treatment will be outlined. The technique of exploratory and therapeutic lateral orbitotomy will be included in the presentation.

Th-6—Panel for Discussions, Problem Cases, and Questions from Those Taking the Course

Although the instructors enjoy being buttonholed by various Academy members in corridors for discussion of cases from back home, we prefer to give these questions and problems consideration during this period. Projectors will be available for slides and photographs. Subscribers may bring their problems for consideration and discussion of those present.

COURSE 13

Room 721 Periods M-6, T-6, W-6

GRAHAM CLARK, M.D.
New York

Retinal Detachment

A three-period course—$6.00

The following outline will be utilized:

I. Types of retinal detachment and their holes: causative mechanisms, surgical approach, and prognostic significance

II. Treatment of the simple detachment, with emphasis on the electrical principles involved in the use of diathermy

III. Treatment of complicated detachments, with discussion of the various procedures for shortening the sclera

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COURSE 14

Room 722 Periods T-4, T-5, W-4, W-5, Th-4, Th-5

ELIZABETH F. CONSTANTINE, M.D.
New York

PHILIP G. SPAETH, M.D.
Philadelphia

ARTHUR LINKSZ, M.D.
and
PHILIP SALVATORI
BY INVITATION
New York

Contact Lenses

A six-period course—$12.00

This course will cover the indications for and the use of corneal lenses and of the various types of scleral lenses, for both cosmetic and medical purposes. It will consist of discussions, demonstration of the contact lenses in use, a demonstration of the molding technique, and a motion picture showing the manufacture of lenses. Discussions will be amplified by question and answer periods.

COURSE 15

Room 782 Periods M-4, M-5, T-4, T-5

COURSE 16

Room 782 Periods W-4, W-5, Th-4, Th-5

JACK C. COPELAND
Chicago

Streak Retinoscopy

A four-period course—$8.00

This four-hour course is being presented twice, as Course 15 on Monday and Tuesday and as Course 16 on Wednesday and Thursday. **Please select course number according to days on which you wish to attend.**

The following outline describes the steps of the demonstration:

1. Determining the neutral point
2. Revealing low astigmatic errors
3. Locating the zone of the astigmatic band
4. Determining the power of the cylinder
5. Estimating the type and degree of error without lenses
6. Refining axis position by "Guide Angle" technique
7. Plus cylinder procedure

COURSE 17

Room 731 Periods M-4, M-5, M-6

FRANK D. COSTENBADER, M.D.
Washington, D. C.

CHARLES F. COOPER, JR., M.D.
and
ALTHEA J. TIBBS
BY INVITATION
Atlanta

Orthoptics for the Practicing Ophthalmologist

A three-period course—$6.00

This course will be directed to the ophthalmologist who does not have an orthoptist. There will be a classification of heterotropia and heterophoria, and detailed discussion of techniques for handling and treating the patient according to age level. Various tests for diagnosis of oculomotor anomalies and factors influencing the decision on the type of operation to be performed.

Orthoptic diagnosis and treatment of exotropia, intermittent exophoria, accommodative esotropia, abnormal retinal correspondence, blind spot syndrome, esotropia, suppression, poor absolute and poor relative vergences, will be demonstrated. All techniques described can be easily carried out by the doctor in the office and by the patient at home. A short motion picture will be shown demonstrating various tests.

COURSE 18

Room 786 Periods T-4, T-5

GERALD E. FONDA, M.D.
Short Hills, N. J.
and
LOUISE SLOAN, Ph.D.
Baltimore
BY INVITATION

Subnormal Vision: Technique for Examination

A two-period course—$4.00

The technique for subnormal vision examination, with emphasis upon the importance of history taking, nonoptical methods of correction, and the sequence of examination procedures, including the trial of different types of lenses, will be considered.

Correction of 80 per cent of patients with subnormal vision can be accomplished from the trial case by extension of the routine eye examination. The types of lenses used are conventional lenses, strong reading additions for monocular and binocular use, doublet magnifiers, microscopic bifocals, and telescopic lenses. Bifocals with reading additions up to +32.00 diopters are successful.

Various lenses will be demonstrated, and indications for their use will be explained. Types of pathologic ocular conditions, favorable and unfavorable for correction, will be classified.

Method of testing visual acuity at 40 cm. for determining diopter power required for variable degrees of visual defect will be explained.

COURSE 19

Room 778 Periods T-4, T-5

HELEN GIBBONS
FLORENCE CUNNINGHAM, R.N.
New York
BY INVITATION

Educational Management of Partially Seeing Children

A two-period course—$4.00

This course is designed to bring to the ophthalmologist basic information regarding educational planning for partially seeing children. The course will include discussion of the identification of partially seeing children through follow-up of vision screening; the three types of educational programs now in effect; and the material and equipment suited to the needs of these children. A motion picture which depicts integration of the partially seeing child into the regular school program will be shown and discussed.

COURSE 20

Room 734 Periods W-5, W-6 Th-4, Th-5

GLEN G. GIBSON, M.D., et al

Surgery of Heterotropia

A four-period course—$8.00

Adequate diagnosis of heterotropia consists of determination of the cause and the type of deviation, as well as the state of the sensory and motor correspondence. An adequate diagnosis is essential to appropriate planning of the surgical management of the heterotropias. This entails an evaluation of the events which preceded and followed the deviation. The objective of this continuous course is to correlate classification, clinical course, operative technique, and surgical judgment in planning for a functional or cosmetic result.

The first hour will be devoted to constructive criticism of current classification, and a correlation of clinical course and surgical objectives. During the second hour some of the present fallacies and pitfalls in operative technique, will be demonstrated. A base line for sound operative procedure will be discussed. Principles of the operative management of congenital and paretic deviations will be presented in the third hour. The fourth period will be devoted to indications and contraindications for surgical planning for functional and cosmetic end results.

W-5—Surgical Implications of Classification
Edwin C. Tait, M.D.
Philadelphia

W-6—Surgical Technique
Lewis R. Wolf, M.D.
Philadelphia

Th-4—Selection of Operative Procedure in Paretic Heterotropia
Robison D. Harley, M.D.
Philadelphia

Th-5—Planning the Time, Type, and Amount of Surgical Correction
Glen G. Gibson, M.D.
Philadelphia

COURSE 21

Room 736 Periods M-4, M-5, T-4, T-5, W-4, W-5, Th-4, Th-5

WENDELL L. HUGHES, M.D., et al

Ophthalmic Plastic Surgery: Fundamental

An eight-period course—$16.00

This course is planned in conjunction with the advanced course in Ophthalmic Plastic Surgery (Course 12) and is designed primarily for those interested in plastic and reparative procedures in the region of the eye but whose experience and training have been limited.

M-4 & 5—Basic Principles
Wendell L. Hughes, M.D.
Hempstead, N. Y.

These two hours will be devoted to basic surgical principles, choice of tissues, anesthesia, preoperative and postoperative care, instruments, dressings, types of grafts and flaps, types of insertions.

T-4—Burns and Lacerations of the Conjunctiva and Lids

Sidney A. Fox, M.D.
New York

The results of chemical and physical burns of the conjunctiva and lids will be discussed and their treatment considered. Procedures for the repair of the various types of lid lacerations will be outlined.

T-5—Conjunctival Surgery

Deane C. Hartman, M.D.
Los Angeles

Preparation of conjunctival flaps and buccal mucous membrane grafts. Surgical treatment for pterygium and benign conjunctival tumors. Symblepharon repair and partial socket reconstruction.

W-4—Entropion and Trichiasis

Joseph C. Hill, M.D.
Toronto, Ont., Canada

The methods of determining the important factors in the examination of entropion and trichiasis will be discussed. The surgical management of various types and degrees of entropion, trichiasis and distichiasis will be covered in detail using colored slides and motion pictures.

W-5—Ptosis, Blepharochalasis and Baggy Lids

M. Noel Stow, M.D.
Washington, D. C.

The various types of blepharoptosis and the important points for surgical corrections will be discussed. Emphasis will be placed on the complications and how to avoid them. Senile laxity of the tissues and skin of the upper and lower lid, with its symptoms and corrective measures, will be presented.

Slides and a motion picture will be used for demonstration.

Th-4—Lacrimal Apparatus

J. Gordon Cole, M.D.
New York

Abnormalities of the lacrimal system, such as oversecretion, undersecretion, impaired or blocked lacrimal drainage, will be discussed.

Th-5—Panel Discussion

During this period the instructors will clarify or augment remarks made in their lectures. Those men taking the course may bring up questions for discussion. They may also bring pictures of cases which they wish discussed.

Those planning to take the course may write any member of the panel in advance to request discussion of certain subjects in this field.

COURSE 22

Room 732 Periods W-4, W-5, W-6

CHARLES E. ILIFF, M.D.
Baltimore

CARL CORDES JOHNSON, M.D.
Boston

JACK S. CRAWFORD, M.D.
Toronto, Ont., Canada

ROBERT SCHIMEK, M.D.
New Orleans

Ptosis

A three-period course—$6.00

1. Anatomy of the lids
2. Types of ptosis
3. Operative correction: levator surgery; frontalis surgery; superior rectus surgery
4. Complications

COURSE 23

Room 731 Periods W-4, W-5

FRITZ JARDON
Detroit
BY INVITATION

HUGH LAUBHEIMER
Ft. Lauderdale, Fla.
BY INVITATION

Fitting Ocular Prostheses

A two-period course—$4.00

This course will cover all aspects of techniques for fitting prostheses in enucleations, eviscerations and Burch eviscerations. Doctors are invited to bring

their problem cases for practical demonstrations. This should be of special interest to those doctors in the field who do their own fitting.

An extended question and answer period will follow.

COURSE 24

Room 710 Periods M-4, M-5, M-6, T-4, T-5, T-6, W-4, W-5, W-6

WILLIS S. KNIGHTON, M.D., et al

Practical Essentials of Glaucoma

A nine-period course—$18.00

A practical course in glaucoma designed to familiarize the student with present-day thinking regarding classification, diagnosis and treatment. The practical application of modern concepts and methods of examination and treatment will be emphasized.

M-4—Introduction
Willis S. Knighton, M.D.
New York

M-5—Chronic Simple Glaucoma
Joseph S. Haas, M.D.
Chicago

M-6—Narrow Angle Glaucoma
P. Robb McDonald, M.D.
Philadelphia

T-4—Gonioscopy
Robert N. Shaffer, M.D.
San Francisco

T-5—Tonography
Andrew de Roetth, Jr., M.D.
New York

T-6—Medical Therapy
Irving H. Leopold, M.D.
Philadelphia

W-4—Secondary Glaucoma
Earle H. McBain, M.D.
San Rafael, Calif.

W-5—Surgery
John M. McLean, M.D.
New York

W-6—Congenital Glaucoma
A. Edward Maumenee, M.D.
Baltimore

COURSE 25

Room 777 Periods Th-4, Th-5, Th-6

PLACIDUS J. LEINFELDER, M.D.
Iowa City

GEORGE BOUNDS, M.D.
Nashville

THOMAS P. KEARNS, M.D.
Rochester, Minn.

Diagnostic Aids in Neuro-ophthalmology

A three-period course—$6.00

A consideration of the various neurologic and ophthalmologic techniques that are available to facilitate neuro-ophthalmic diagnosis. This will include a critical analysis of the use of perimetry, visual acuity, ocular rotations, pupillary studies, and ophthalmoscopy, and utilization of the neurologist and neurosurgeon in performing cerebrospinal fluid examination, ventriculography, pneumoencephalography and roentgenography with angiography. A discussion of the clinical application of these examinations to the neuro-ophthalmic syndromes will conclude the course.

COURSE 26

Room 706 Periods M-4, M-5, M-6

ALBERT N. LEMOINE, JR., M.D.

JAMES T. ROBISON, M.D.

LARRY L. CALKINS, M.D.
Kansas City, Mo.

Fundus Lesions: Differential Diagnosis

A three-period course—$6.00

Kodachrome fundus photographs will be presented with discussion of the significant points in the differential diagnosis of the various types of fundus disease. Photomicrographs demonstrating the pathologic processes that produce the fundus picture will be shown. The correlation between the anatomic changes and fundus appearance will be discussed in detail.

COURSE 27

Room 721 Periods M-4, M-5

ARTHUR LINKSZ, M.D.
New York

Physiology of Vision

A two-period course—$4.00

Some problems of clinical visual physiology will be discussed informally, with demonstrations. Questions by the audience will be encouraged. Suggested topics include tests for color vision in the office; office tests for binocular vision and space perception; office tests for ocular motility and their physiologic bases; elementary clinical geometric optics (choice of bifocals, use of prisms, base curves, size lenses); principles of quantitative perimetry and scotometry (with special reference to the Goldmann perimeter); dark adaptation. As many of these topics as possible, or even entirely different topics, could be discussed, depending on the wishes of the audience.

COURSE 28

Room 722 Periods M-4, M-5

RALPH I. LLOYD, M.D.
Brooklyn

Diseases of the Cornea

A two-period course—$4.00

The slit lamp has had almost as important an effect upon our knowledge and treatment of the cornea and its diseases as the ophthalmoscope did in the hands of Graefe and his colleagues. This period will be devoted to study of corneal injuries and diseases, special attention being given to early diagnosis and treatment of the insensitive corneas occurring in Fuch's dystrophy and dendritic keratitis. The effects of hereditary dystrophies have been considered irreparable, but recent experience with corneal transplants has made reconsideration of established practices imperative.

COURSE 29

Rooms 788 & 789 Periods M-4, M-5
M-6, T-4, T-5, T-6
W-4, W-5, W-6

ROBERT J. MASTERS, M.D.
Indianapolis

HARVEY E. THORPE, M.D.
Pittsburgh

ALEXANDER A. KRIEGER, M.D.
Pittsburgh

JOHN MELVIN MASTERS, M.D.
Indianapolis

SAMUEL N. KEY, M.D.
Austin, Texas

FRED M. WILSON, M.D.
Indianapolis

THEODORE R. LeMASTER, M.D.
Indianapolis

CHARLES REEL, M.D.
Pittsburgh

Slit Lamp Biomicroscopy: Fundamentals

A nine-period course—$18.00

This course is especially planned for ophthalmologists who have not had the opportunity to learn how to use the slit lamp biomicroscope. The illustrated lectures have been shortened as much as seems commensurate with adequate elementary didactic instruction, in order to provide ample time for actual work with several types of biomicroscopes in the laboratory. If any registrant is especially interested in learning to use a particular kind of biomicroscope, he will be given this opportunity with the help of our instructors. During the many years since our group first began to present our Academy course in biomicroscopy, we have sometimes been disturbed by the thought that some of our inexperienced registrants were failing to learn as much as we wanted them to, because they were embarrassed in the presence of other class members who were more experienced. We have therefore set up this elementary course for those who want to start at the beginning and to enjoy the satisfaction of rapidly learning to use this indispensable instrument.

COURSE 30

Room 705 Periods M-4, M-5, T-4, T-5

JOHN M. McLEAN, M.D.
New York

JACK GUYTON, M.D.
Detroit

A. EDWARD MAUMENEE, M.D.
Baltimore

Practical Factors in Eye Surgery

A four-period course—$8.00

Each of the instructors will speak for one hour on practical points in surgery which he has found useful in his own hands and in teaching residents. They will also present lantern slides and motion pictures. While one instructor is speaking, the others will be present to give running comments on the speaker's ideas. The remaining time will be devoted to summary and consideration of points brought up by the class for specific discussion.

COURSE 31

Room 712 Periods M-4, M-5, M-6

CARROLL R. MULLEN, M.D.
and
SAMUEL BLANK, M.D.
BY INVITATION
CHARLES G. STEINMETZ, III, M.D.
GERARD M. SHANNON, M.D.
Philadelphia

Ocular Emergencies

A three-period course—$6.00

Anesthesia and its allied problems regarding injuries to the lids, globe and other emergency conditions of the eye will be presented. Indications and contraindications to local or general anesthesia will be discussed from the standpoint of the risks encountered, not only generally but also in specific ophthalmic emergencies. The emergencies will include trauma, foreign bodies, acute glaucoma, corneal transplant surgery on emergency basis, and the management of patients having associated cerebral injury. Preparation and preliminary medication for local and general anesthesia will be given as well as specific instruction for management of patients on steroid therapy, cardiacs and diabetics. Tranquilization and aids for local anesthesia and a resume of hypotensive anesthesia in ophthalmology will be outlined. Choice of anesthetic in children as well as in adults with postanesthetic management will be discussed.

Diagnosis and treatment of penetrating intraocular wounds will be considered. Localization and extraction of intraocular foreign bodies will be dealt with in detail. Complications of trauma will be explained and treatment will be enumerated. Industrial emergencies and irradiational problems will be outlined and discussed.

The care of injuries of the eyelids including marginal lacerations will be presented. Two methods of repair in order to avoid a notched scar will be covered in detail. First, the figure eight suture (being the most simple and most rapid method) and second, a modification of the Wheeler halving procedure will be discussed. Use of temporary and permanent tarsorrhaphy with emphasis on pressure dressings will be given with diagrams and demonstration. Lacerations involving the canaliculi will also be presented and methods used being dependent upon the location of the break in the canaliculus. A discussion of the early treatment of orbital fractures will be presented. Fractures will be divided into those involving the orbital rim and the so-called "blow-out fracture" in which the orbital rim is intact. Finally, repair of lid injuries where tissue loss has resulted will be presented briefly and will include the emergency measures necessary to preserve the globe.

COURSE 32

Room 716 Periods W-5, W-6, Th-4, Th-5

MARSHALL M. PARKS, M.D.
DAN G. ALBERT, M.D.
Washington, D. C.

Eso-Deviations

A four-period course—$8.00

The two principal causes of nonparalytic esophoria and esotropia are (1) accommodative convergence and (2) tonic convergence. The objective of this course is to develop a method by which each of these causative factors can be recognized and treated. Illustrative cases of various types of such deviations will be used in order to make the material presented as practical as possible for the practicing ophthalmologist.

The following topics will be discussed:

1. Horizontal vergences
   a. Accommodative convergence
   b. Tonic convergence
   c. Fusional convergence
   d. Fusional divergence
2. Diagnosis and treatment of accommodative esotropia
3. Diagnosis and treatment of nonaccommodative esotropia
4. The special problem of small angle esotropia

COURSE 33

Room 796 — Periods M-4, M-5, T-4, T-5, W-4, W-5

L. HARRELL PIERCE, M.D.
Baltimore

ICHIRO D. OKAMURA, M.D.
Boston

EDWARD W. D. NORTON, M.D.
Miami

Retinal Detachment: Basic Course

A six-period course—$12.00

Symptoms of retinal detachment and methods of treatment will be discussed, with special emphasis on slit lamp examination of the deep vitreous, indirect ophthalmoscopy, and scleral pressure. These methods should help to resolve difficulties in making accurate diagnoses and prognoses. Problems related to subclinical retinal detachment will be covered. The rationale and technique of retinopexy, of lamellar scleral resection and of scleral buckling will be compared. A discussion of technical difficulties will follow with special emphasis on reoperations. Complications encountered and results obtained will be presented.

COURSE 34

Room 732 — Periods M-4, M-5, T-4, T-5

DOHRMANN K. PISCHEL, M.D.
San Francisco

JOSEPH A. C. WADSWORTH, M.D.
New York

BAYARD H. COLYEAR, JR., M.D.
San Francisco

Retinal Detachment

A four-period course—$8.00

The pathologic anatomy of retinal detachment will be presented and the relation of these factors to the clinical development of the disease will be shown. Aids in diagnosis and differential diagnosis will be described. Surgical procedures, including diathermy and the various types of scleral resections, will be discussed.

COURSE 35

Room 731 — Periods T-4, T-5

ADOLPH POSNER, M.D.
GEORGE GORIN, M.D.
New York

Office Gonioscopy

A two-period course—$4.00

The course is intended as a practical introduction to the routine use of gonioscopy. The first period will be devoted to a gonioscopic description of the normal angle and to a survey of those pathologic conditions in which gonioscopy is of value. A simple gonioscopic classification of glaucoma, illustrated with lantern slides, will be presented.

During the second period the technique and equipment will be discussed and ample time will be allowed for a free discussion of problems connected with gonioscopy.

COURSE 36

Room 778 — Periods W-5, W-6

LELAND H. PREWITT, M.D.
Ottumwa, Iowa

Diagnosis and Treatment of Ocular Allergy

A two-period course—$4.00

1. Enzymatic concept of allergy utilized in diagnosis and therapy.
2. Careful detailed allergic history should be taken from infancy to present illness.

3. Skin tests and cytology will be demonstrated.

4. Treatment consists of an elimination program and desensitization.

5. Dosage is established by (a) titration method, and (b) severity of patient's symptoms.

6. Running history is most important: re-evaluate the elimination program, psychotherapy and dosage. Each case must be properly evaluated continuously as modern day therapy may aggravate rather than resolve your problem.

7. Colored slides will illustrate cases of extraocular and intraocular allergy.

COURSE 37

Room 726 Periods M-4, M-5

R. WINSTON ROBERTS, M.D.
Winston-Salem, N. C.

Glaucoma: Early Diagnosis

A two-period course—$4.00

Success in treating glaucoma has proved to be much greater when therapy is begun early in the course of the disease. Screening techniques for early detection of glaucoma cases will be described. Detailed study of suspected cases will be discussed, including the use of modern techniques of tonometry, visual field testing, and especially tonography, provocative testing with tonography, and gonioscopic technique and interpretation. Findings used in a diagnosis and proper classification of very early glaucoma will be reviewed.

COURSE 38

Room 724 Periods W-4, W-5

DANIEL M. ROLETT, M.D.
White Plains, N. Y.

Gonioscopy: Practical Application

A two-period course—$4.00

This course is designed for ophthalmologists familiar with gonioscopy. The use of gonioscopy will be described, first in the diagnosis of primary and secondary glaucomas; second, in the choice of medical and surgical therapy; third, in the evaluation of surgical results. Particular emphasis will be given to the use of gonioscopy in the operating room.

COURSE 39

Room 743 Periods M-4, M-5, T-4, T-5

HUNTER H. ROMAINE, M.D.
New York

Ocular Motility Surgery

A four-period course—$8.00

Surgery of the ocular motor system will be considered from several aspects:

1. The relationship of the preoperative diagnosis and of the preoperative care to the surgical procedure to be undertaken

2. Types of surgical procedures, techniques used in these procedures, and instruments and suture material used in these procedures

3. The horizontal surgical procedures and their relation to existing conditions and to purely vertical muscular anomalies, as well as to combinations of these groups

4. The complications that occur, the handling of these complications, and ways and means to obviate complications

The course will be illustrated by various motion pictures of surgical procedures.

COURSE 40

Room 740 Periods M-6, T-6, W-6

HUNTER H. ROMAINE, M.D.
New York

Difficult Problems in Refraction and Their Treatment

A three-period course—$6.00

A general review of the important problems related to refraction, including a review of the major refractive classifications, will be undertaken at the outset

of this course. Following this, a thorough study of the unusual problems encountered in diseases such as aphakia, anisometropia, and amblyopia will be presented. The refractive sensitivity of an individual and its bearing on the correction prescribed, the methods used in prismatic correction in lenses, and the use of specialized lenses will be discussed. The significance of dominance and its relation to refraction will also be included in the lecture. The course is intended to be a general review of problems in refraction, including special attention to unusual problems.

COURSE 41

Room 733 Periods W-5, W-6

A. D. Ruedemann, Jr., M.D.
Detroit
and
WERNER K. NOELL, M.D.
Buffalo
BY INVITATION

Clinical Electroretinography: Theory and Techniques

A two-period course—$4.00

This course will consist of a discussion of the theoretical evaluation of the electroretinogram and its application to experimental and human techniques. Consideration will be given to methods used and clinical results obtained in a series of cases using a simplified protocol. Slides and demonstrations of techniques will be shown.

COURSE 42

Room 796 Periods Th-4, Th-5, Th-6

CHARLES L. SCHEPENS, M.D.
Boston

Recent Advances in Retinal Detachment

A three-period course—$6.00

The newer concepts in pathogenesis of retinal detachment will be outlined. This will be followed by a discussion of the rationale of different approaches to surgery of retinal detachment. Recently developed surgical techniques will be described, and results presented.

COURSE 43

Room 732 Periods Th-4, Th-5

ROBERT A. SCHIMEK, M.D.
New Orleans
FRANKLYN P. BOUSQUET, M.D.
Savannah, Ga.

Clinical Gonioscopy and Tonography

A two-period course—$4.00

I. Gonioscopy

Gonioscopy will be demonstrated on human subjects, with emphasis on its practical applications. Members of the group will be given the opportunity to perform gonioscopy by each of the available gonioscopic techniques: with the various gonioprisms at the slit lamp, with the goniolens and the stereogonioscope, and with surgical gonioscopic methods. Members of the group will be assisted in using the gonioscope to observe the normal angle structures and their variations in human subjects. Stereoscopic viewers will be used to show landmarks of normal and abnormal angles as they actually appear during gonioscopy.

II. Tonography

The theory of tonography will be presented in simplified form, again with emphasis on its practical applications. Tonography will be demonstrated. Values, limitations and sources of error in tonography and its importance in office care of glaucoma patients will be discussed.

The correlation of gonioscopic and tonographic findings in determining diagnosis, treatment and prognosis will be stressed.

COURSE 44

Room 724 Periods Th-4, Th-5

THEODORE F. SCHLAEGEL, JR., M.D.
Indianapolis
LOUIS N. HUNGERFORD, JR., M.D.
Seattle

Uveitis

A two-period course—$4.00

Since uveitis should be classified as granulomatous or nongranulomatous as

the first step in the process of diagnosis and therapy, this division will be followed in our discussion. The methods of making this classification and of making an etiologic diagnosis based on clinical and laboratory features and the essentials of treatment will be detailed.

ALBERT E. SLOANE, M.D.
Boston
BERNARD C. GETTES, M.D.
Philadelphia

Refraction

The following three courses dealing with Refraction, Course 45, Course 46, and Course 47, will be under the direction of Albert E. Sloane, M.D. They may be purchased jointly or separately as your schedule permits.

COURSE 45

Room 727 Periods M-4, M-5

School Vision Testing: Program, Problems and Methods

Albert E. Sloane, M.D.

A two-period course—$4.00

This course will provide the ophthalmologist with background for this important phase of public health work. In recent years increasing emphasis is being placed on such programs throughout the country, and the eye doctor is more often asked to act either in an advisory capacity or in the actual setting up of such procedures. Various methods of testing will be demonstrated and their present relative merits discussed. Other important problems involved in such programs will be discussed.

COURSE 46

Room 727 Periods T-4, T-5

Telescopic Lenses and Other Aids for Subnormal Vision

Albert E. Sloane, M.D.

A two-period course—$4.00

In this course the ophthalmologist will be given an appreciation of the value and limitations of telescopic lenses and simple methods of testing their usefulness. Techniques for utilizing the various types of lenses now available will be demonstrated. Many other aids for increasing the size of the retinal image are available, easily fitted, and quite inexpensive. These will also be presented with relation to their clinical application.

COURSE 47

Room 727 Periods W-4, W-5

Bernard C. Gettes, M.D.

A two-period course—$4.00

A. Criteria for Prescription of Prisms in Ophthalmic Practice

A working formula for guidance in prescribing prisms will be presented. The standard textbook can only generalize regarding this phase of treatment, since all cases must be considered individually. Nevertheless, some system of guidance is desirable and helpful even though subject to error. Our classification of heterophorias will indicate in which cases prisms should be prescribed and how the strength of the prism may be determined.

B. Drugs Used in Refraction

The place of cycloplegia in refraction has always been a controversial subject. Its advantages and shortcomings will be presented with indications and contraindications for its use. The relative merits of the several cycloplegics and the best methods for their administration will be considered. Miotics will be discussed, and their effect in accommodative strabismus will be considered.

COURSE 48

Room 715 Periods M-5, M-6

M. NOEL STOW, M.D.
L. CONNER MOSS, M.D.
Washington, D. C.

Diagnostic and Therapeutic Office Procedures

A two-period course—$4.00

Pathologic conditions requiring medical or surgical treatment which are encountered in office or clinic practice will be discussed. They are neither rare nor routine, but their early detection or effective management may present some difficulty.

During the first hour, practical study will be made of such problems as ophthalmic pain, detection of holes in the retina prior to detachment (direct ophthalmoscopy), herpes zoster, persistent twitching of the orbicularis, and daily use of mydriatics in cases of early cataract.

Included in the second hour will be discussion of the surgical treatment of chalazia, xanthelasmas, hemangiomas, papillomas, dyskeratoses, melanomas, and basal cell and squamous cell carcinomas.

Kodachrome slides will be used for illustration.

COURSE 49

Room 754 — Periods M-4, M-5, M-6, T-4, T-5, T-6, W-4, W-5, W-6, Th-4, Th-5, Th-6

GEORGIANA D. THEOBALD, M.D., et al.

Histopathology

A twelve-period course—$24.00

The teaching will be by lecture, microprojection and microscope. It is recommended that the student review the normal histology of the eye before attending this course.

The Cornea

Frederick C. Blodi, M.D.
Iowa City

The normal histology will be reviewed. The anatomical picture will be correlated with the slit lamp examination of the cornea. The problem of corneal transparency will be discussed from an anatomical, chemical and physical point of view.

The general pathology of the cornea will be discussed in the following order: corneal edema, vascularization, keratitis, wound healing, epithelial changes and changes in Descemet's membrane and on the posterior corneal surface.

The specific pathology will include a discussion of suppurative and nonsuppurative keratitis, senile changes, corneal degenerations, and pigmentations.

Pathogenesis of Some Intraocular Surgical Complications

Leonard Christensen, M.D.
Portland, Ore.

This presentation is concerned with the tissue alterations, pathogenesis and sequelae of the more common complications in intraocular surgery. The lectures will be illustrated with photomicrographs.

Pathology of the Optic Nerve

Windsor S. Davies, M.D.
Detroit

A classification of the pathologic changes as observed in the optic nerve will be presented. Various lesions will be demonstrated by lantern slides. A correlation will be made between clinical and pathologic findings.

Tumors of the Orbit

Arnold W. Forrest, M.D.
White Plains, N. Y.

There will be a discussion of the pathologic characteristics of orbital tumors and the clinical conditions which result from them. The seven most common types, which comprise 75 per cent of primary orbital tumors, will be studied in detail. Sections will be provided for microscopic examination.

The Retinopathies

William C. Frayer, M.D.
Philadelphia

The discussion will deal primarily with the histologic changes produced in the choroid and retina by hypertension, diabetes and arteriosclerosis. Particular emphasis will be given to the underlying anatomic and physiologic vascular disturbances. Histologic features of the retinopathies will be correlated with their clinical appearance and will be illustrated by lantern slides and microscopic sections.

Pathology of the Lens

Michael J. Hogan, M.D.
San Francisco

The purpose of this lecture will be to present the normal histology of the lens and the etiology and pathogeny of cataractous changes. The histopathology will be described in detail, including changes in the capsule, lens epithelium, and lens fibers. Senile cataract in its various manifestations will be discussed from a clinical and pathologic standpoint. Cataracta complicata of the posterior and anterior types will be demonstrated. Diabetic and metabolic cataracts will be discussed.

Pathology of Glaucoma

A. Ray Irvine, Jr., M.D.
Los Angeles

The instruction on glaucoma will include the pathologic changes found in open and in closed angle glaucoma. The usual causes of secondary glaucoma, such as occlusion of the central retinal vein, lens changes, and neoplasms of the anterior segment, will be discussed. The effect of increased intraocular pressure upon each part of the eye, such as destruction of the corneal endothelium with subsequent bullous keratopathy and necrosis of the iris with atrophy, will be included. There will be illustrative photomicrographs shown and actual slides of primary glaucoma will be presented.

Tumors of the Uvea

John S. McGavic, M.D.
Bryn Mawr, Pa.

All of the tumors involving the uveal tract will be discussed and illustrated. Both primary and secondary tumors will be included. Most of the time will be devoted to benign and malignant melanomas, as they are the most common. Nevi, neurofibromas, hemangiomas, leiomyomas, xanthoendotheliomas, lymphomas and various metastatic tumors will be presented. Microscopic sections will be available for study as well as for projection.

Tumors of the Retina

Edith Parkhill, M.D.
Rochester, Minn.

BY INVITATION

The gross and microscopic pathology of retinoblastoma will be presented with the aid of lantern slides. Factors in etiology and prognosis will be considered; when the cases are classified according to certain factors in the history and microscopic findings, it is found that the survival rate in one group is almost 100 per cent.

Cells Found in Inflammatory Lesions

Georgiana D. Theobald, M.D.
Oak Park, Ill.

Cytology, pathology and sequelae of ocular inflammations will be discussed.

Granulomatous Infections of the Eye

Lorenz Zimmerman, M.D.
Washington, D. C.

Among the many different causes of "granulomatous inflammation" involving ocular tissues are infectious agents which may be demonstrated histologically within the eye. These include nematode larvae, Toxoplasma, tubercle bacilli, leprosy bacilli, Treponema, inclusion bodies, and fungi such as Blastomyces and Cryptococcus. None of these are demonstrated with ease since a prolonged search of serial sections is necessary in some cases and special staining techniques are required in others.

"Granulomatous inflammation" is a term preferred to "granulomatous uveitis" since in many of these infections the process is neither primarily nor predominantly uveal. Sympathetic ophthalmia is the only type of granulomatous inflammation that is a true uveitis.

Nongranulomatous Infections of the Eye

Lorenz Zimmerman, M.D.

Eyes are seldom enucleated during the active phases of nongranulomatous uveitis. The pathologist, therefore, rarely has an opportunity to study the initial changes which take place in the tissues in nongranulomatous uveitis. By the time eyes are enucleated, there are usually complicated features which tend to obscure the basic tissue reaction. In those cases in which active inflammation is still present, the uveal reaction in some cases is predominantly lymphocytic, and in these cases there may be conspicuous nodular aggregations of lymphocytes. In others there is a more diffuse plasma cell reaction and in these, one frequently observes many Russell bodies. Because plasmacytosis has been correlated with antibody production, it is possible that the dense infiltration of plasma cells indicates active antibody formation in the affected uveal tissue.

Nongranulomatous uveitis may involve primarily the anterior segment in which case the formation of anterior and posterior synechias, occlusion and seclusion of the pupil, iris bombe, secondary glaucoma, and complicating cataract are frequently observed sequelae by the time the eye comes to enucleation. In those cases involving the posterior segment, retinal degeneration and proliferation of the pigment epithelium are infrequently observed. Alterations in the vitreous are also seen.

COURSE 50

Room 793 Periods W-4, W-5

HARVEY E. THORPE, M.D.
and
SAMUEL BERMAN
BY INVITATION
Pittsburgh

Intraocular Foreign Bodies

A two-period course—$4.00

A comprehensive survey of established and newly developed techniques for the removal of foreign bodies from the eyeball will be presented.

Magnetic and nonmagnetic intraocular foreign bodies create special surgical problems. Accurate determination of functional and anatomic damage is important. Methods for evaluation of extent of trauma to ocular tissues and of impairment of vision will be analyzed.

Location of foreign bodies by roentgenograms must be accurate for successful operation. The electroinductive locator is a distinct help in foreign body localization both before and during operation. These methods of localization will be elaborated in this course.

The surgical technique for removal of foreign bodies must be properly planned from incision to closure. Techniques for removal of foreign bodies from the anterior chamber, iris, lens, ciliary body, vitreous, and retina will be reviewed.

There will be a discussion of the management of associated complications, such as laceration, uveal and vitreous prolapse, traumatic cataract, retinal detachment and infection. A review of preoperative and postoperative care will be included.

COURSE 51

Rooms 788 & 789 Periods Th-4, Th-5, Th-6

HARVEY E. THORPE, M.D.
Pittsburgh

ROBERT J. MASTERS, M.D.
Indianapolis

ALEXANDER A. KRIEGER, M.D.
Pittsburgh

JOHN MELVIN MASTERS, M.D.
Indianapolis

FRED M. WILSON, M.D.
Indianapolis

Advances in Slit Lamp Biomicroscopy, and Applanation Tonometry

A three-period course—$6.00

This advanced course in recent developments in slit lamp biomicroscopy will cover:

1. Use of Hruby lens
2. Use of flat contact lens for slit lamp ophthalmoscopy
3. Slit lamp ophthalmoscopy and cycloscopy with 4-mirror gonioprism, also Goldmann 3-mirror lens
4. Applanation tonometry

These illustrated lectures will be fairly comprehensive. They will cover the new techniques in cycloscopy, the study of the equatorial region of the crystalline lens, the examination of the extreme retinal and vitreous periphery, and the technique of applanation tonometry. The study of the posterior vitreous and retina with the Hruby lens, with the contact lens, as well as with the gonioprism, and biomicroscope will be included in this course.

The first two periods of the course will be devoted to illustrated lectures and discussion. The last period will be spent in the demonstration room, where the students will be afforded practice with the new instruments utilized in making examinations of the lens periphery and posterior vitreous. Slit lamp ophthalmoscopy of the central and peripheral retina, which is a recent development, will be stressed; it is especially valuable in finding vitreous bands and peripheral retinal tears, as well as in the differential diagnosis of retinal pathologic changes.

The technique of applanation tonometry with Professor Goldmann's attachment to the slit lamp will be discussed and demonstrated. This is a new development in tonometry which obviates some errors introduced by the factor of scleral rigidity.

COURSE 52

Room 793 Periods M-4, M-5, M-6, T-4, T-5, T-6

HARVEY E. THORPE, M.D.
Pittsburgh
and
LEE ALLEN
Iowa City
BY INVITATION

Slit Lamp Gonioscopy

A six-period course—$12.00

Slit lamp gonioscopy is essentially a major subdivision of biomicroscopy. This course, intended for the advanced student, will cover the subject of clinical gonioscopy. The original methods of gonioscopy will be covered in outline form. The newer methods of slit lamp gonioscopy employing contact prisms and reflecting contact lenses yield more information than methods not employing the slit lamp. They will be covered in detail.

The following subjects will be included in the discussion:

1. Angle microanatomy and some phases of angle development
2. Gonioscopic instrumentation
3. Correlation of the slit lamp gonioscopic view with histoanatomy
4. The normal angle
5. Congenital anomalies
6. Degenerative changes
7. Inflammatory diseases
8. Glaucoma and observations following operation for glaucoma
9. Cysts and tumors visible with the gonioscope
10. Observations following intraocular surgery
11. Trauma and foreign bodies of the angle

One period will be devoted to practical demonstration of gonioscopy with the slit lamp biomicroscope.

COURSE 53

Room 726 Periods Th-4, Th-5

C. DWIGHT TOWNES, M.D.
Louisville, Ky.

Cataract Surgery: Complications

A two-period course—$4.00

During the first hour, this course will be devoted to a discussion of methods by which complications can be avoided. This will include study of the patient's systemic condition with elimination, so far as is possible, of conditions which might have some bearing upon the cataract operation. It will also include preoperative sedation and analgesia, local and general anesthesia and operative technique.

During the second hour, management of various complications will be discussed and a statistical review of all the complications encountered in personal experience during the year July 1, 1959, to June 30, 1960, will be presented.

COURSE 54

Room 728 Periods M-5, M-6, T-5, T-6, W-5, W-6, Th-5, Th-6

RICHARD C. TROUTMAN, M.D., et al.

Recent Advances in Ophthalmology

An eight-period course—$16.00

This course is planned to give the practicing ophthalmologist a brief review of the most important advances in the various fields under discussion. It will cover not only a review of the current literature in the field, but also personal experiences of interest of the various lecturers.

M-5—Ophthalmic Surgery
Richard C. Troutman, M.D.
New York

M-6—Neuro-ophthalmology
Robert S. Jampel, M.D.
Brooklyn
BY INVITATION

T-5—Pediatric Ophthalmology
Austin I. Fink, M.D.
Brooklyn

This new ophthalmologic specialty, which is rapidly developing, presents many interesting problems. Some new

entities will be discussed. The author's method of handling pediatric patients will be presented.

T-6—Glaucoma
Bernard Schwartz, M.D.
Brooklyn

W-5—Strabismus
Abraham Schlossman, M.D.
New York

The newer concepts of strabismus surgery and diagnosis with reference to the use of orthoptics will be presented. The clinical applications of electromyography will be discussed.

W-6—Contact Lenses
Seymour Van, M.D.
New York
BY INVITATION

Th-5—Plastic Surgery
Peter H. Ballen, M.D.
Hempstead, L. I., N. Y.

New developments in the field of lid and plastic surgery will be presented with special reference to treatment of chemical burns of the eye and certain newer reconstructive techniques for replacement of tissues following excision of tumor.

Th-6—Detachment
Morton Rosenthal, M.D.
Brooklyn

A discussion of the newer techniques in operations for retinal detachment will be given, and an evaluation of these techniques with special reference to the newer techniques of scleral shortening and vitreous transplantation will be made

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COURSE 55

Room 733 Periods T-5, T-6

RICHARD C. TROUTMAN, M.D.
New York

Enucleation Surgery: Complications and Their Management

A two-period course—$4.00

Interest in enucleation surgery has received impetus in recent years due to the development of new implants and prosthetic techniques. These materials and techniques have imposed problems which have not been seen in large numbers by the average ophthalmologist. The added interest in this problem has made it possible for some of us to see and treat enucleation complications. A summary of my experience in the field will be presented, with accompanying case presentations and a motion picture demonstration of operative repairs.

In addition, the newer methods of prosthetic fitting will be presented by Mr. Hugh Laubheimer, emphasizing the close cooperation that is now present and which is necessary for the proper care of the patient with an enucleated eye.

COURSE 56

Room 733 Periods Th-4, Th-5

GEORGE N. WISE, M.D.
New York

Retinal Diseases: Differential Diagnosis

A two-period course—$4.00

The importance of proper diagnosis in prognosis and therapy will be stressed. The points in differential diagnosis of retinal diseases will be demonstrated by kodachrome slides.

COURSE 57

Room 776 Periods M-4, M-5, M-6, T-4, T-5, T-6, W-4, W-5, W-6, Th-4

Home Study Course Discussion Periods

A ten-period course—$20.00

These discussion periods will be conducted by members of the faculty of the Home Study Course in Ophthalmology, and will be based on subject material covered by the Course. They will provide a review of basic subjects and will present up-to-date clinical applications.

M-4—Embryology, Anatomy and Neuroanatomy
John Woodworth Henderson, M.D.
Ann Arbor, Mich.
M. Noel Stow, M.D.
Washington, D. C.

M-5—Physiology

Robison D. Harley, M.D.
Atlantic City

Elmer J. Ballintine, M.D.
Cleveland

Hendrie W. Grant, M.D.
St. Paul, Minn.

Irving H. Leopold, M.D.
Philadelphia

M-6—Optics and Principles of Biomicroscopy

Bourne Jerome, M.D.
Minneapolis

Charles J. Campbell, M.D.
New York

Arthur Linksz, M.D.
New York

T-4—Refraction

Manuel L. Stillerman, M.D.
Chicago

Bernard C. Gettes, M.D.
Philadelphia

Frank W. Newell, M.D.
Chicago

T-5—Ocular Microbiology, External Diseases and Aseptic Techniques

Henry F. Allen, M.D.
Boston

Samuel J. Kimura, M.D.
Berkeley, Calif.

James H. Allen, M.D.
New Orleans

John F. McKenna, M.D.
S. Miami, Fla.

T-6—Perimetry and Neuro-ophthalmology

Edward W. D. Norton, M.D.
Miami, Fla.

John P. Wendland, M.D.
Minneapolis

Placidus J. Leinfelder, M.D.
Iowa City

Cecil W. Lepard, M.D.
Detroit

W-4—Extraocular Muscles

Hunter H. Romaine, M.D.
New York

Hermann M. Burian, M.D.
Iowa City

Conrad Berens, M.D.
New York

W-5—Ophthalmoscopy and Medical Ophthalmology

Banks Anderson, M.D.
Durham, N. C.

Frank C. Winter, M.D.
Palo Alto, Calif.

George N. Wise, M.D.
New York

W-6—Pathology

John S. McGavic, M.D.
Bryn Mawr, Pa.

Joseph A. C. Wadsworth, M.D.
New York

Michael J. Hogan, M.D.
San Francisco

Georgiana D. Theobald, M.D.
Oak Park, Ill.

Th-4—Pharmacology and Therapeutics

Alfred J. Kreft, M.D.
Portland, Ore.

John E. Harris, M.D.
Portland, Ore.

Andrew de Roetth, Jr., M.D.
New York

Kenneth C. Swan, M.D.
Portland, Ore.

INDIVIDUAL COURSES — OPHTHALMOLOGY

COURSE 101

Room 744 Period W-4

RUDOLF AEBLI, M.D.
New York

End Results of Muscle Surgery

The subject matter of this presentation will be a series of patients followed for a varying number of years, with an evaluation of the end results from a cosmetic and a functional viewpoint. Enthusiastic and excessive operation on the interni or the externi or the vertical muscles interferes with conjugate movements and with convergence and, too frequently, ends in disappointment in later years.

Adhesions, secondary contractures, muscle fibrosis and scar tissue formation are sequelae which produce unexpected and disappointing results and make subsequent corrective operations more difficult and uncertain.

Recession and resection operations are not simple innocuous procedures, especially on the obliques and the vertical recti. A careful dissection with retention of the muscle fascial envelope, maintenance of a good dry field, avoidance of undue trauma to the muscle and the adjacent tissues, and good wound closure are essential to success. In general, excessive crippling of the function of any one muscle should be avoided and the operation should be spread over multiple muscles, thereby retaining good parallel and nonparallel ocular movements.

COURSE 102

Room 778 Period M-5

C. KNIGHT ALDRICH, M.D.
Chicago
BY INVITATION

Emotional Problems of the Ophthalmologist's Patients

The hour will be devoted to a discussion of the causes, symptoms and appropriate treatment of emotional factors of patients seen by the ophthalmologist. The following specific subjects will be covered:

1. General symptomatic manifestations of emotional tension
2. Psychophysiological reactions and the eye
3. Visual hypochondriasis
4. Conversion reactions, such as hysterical blindness
5. The impact of organic disease of the eye
6. Signs of psychosis, with particular reference to visual hallucinations

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COURSE 103

Room 726 Period M-6

HENRY F. ALLEN, M.D.
Boston

Aseptic Technique in Ophthalmology

Recent outbreaks of postoperative endophthalmitis in large hospitals, in addition to sporadic cases in smaller ones, show that the danger of surgical infection is ever present. Many substances and certain devices used for purposes of sterilization can actually serve as carriers of infection. Many new developments have occurred in the fields of air filtration, skin antisepsis, and individualization of solutions for use in the eye. Sterility surveys of operating suites and office treatment facilities are now considered essential. Knowledge of newer preventive measures may reveal unsuspected inadequacies and forestall serious complications which might otherwise beset the most conscientious surgeon.

COURSE 104

Room 715 Period M-4

BENNETT Y. ALVIS, M.D.
St. Louis

Glaucoma Surgery: Long-Term End Results

This study will present the course of the diseases and end results in eyes that have been operated on for various types and stages of glaucoma. It will be based largely on experience with a considerable number of private patients whose cases were followed for varying lengths of time up to thirty or more years. Some comparisons will be made with eyes treated for similar periods by nonsurgical means.

COURSE 105

Room 715 Period T-4

JAMES M. ANDREW, M.D.
Columbus, Ohio

Eye Diseases in Children

The course will include discussion of the following topics:

1. Hospitalization of the young child
2. Congenital lacrimal obstruction
3. Dermoids
   a. Orbital
   b. Corneal-conjunctival
   c. Conjunctival dermatolipoma
4. Anesthesia for pediatric ocular operations and procedures

COURSE 106

Room 721 Period W-4

TAYLOR ASBURY, M.D.
Cincinnati

Practical Genetics in Everyday Office Practice

It is increasingly important that the clinician be aware of the practical importance of genetics in everyday practice. Much has been learned about the genetic background of many eye diseases. It is necessary to understand a few basic principles of genetics in order to be able to counsel patients in an intelligent way, but one need not be an expert geneticist.

This course approaches the subject in a simple way, beginning with the basic principles of dominant, recessive, and sex-linked inheritance. Practical advice for patients relative to specific diseases such as retinoblastoma, refractive errors, strabismus, retinitis pigmentosa, glaucoma, and cataract will be discussed, as well as the more important recent advances in the field of genetics.

COURSE 107

Room 715 Period W-6

K. W. ASCHER, M.D.
Cincinnati

Cyclodialysis: Details of the Technique

Cyclodialysis aims at obtaining a permanent cleft between the ciliary body and the inner surface of the sclera. Devised more than fifty years ago, experience of many decades proved its efficiency in open angle glaucoma and in secondary glaucoma following cataract extraction. Details of the technique are discussed with special regard to avoiding possible complications.

COURSE 108

Room 724 Period T-4

WALTER S. ATKINSON, M.D.
Watertown, N. Y.

Anesthesia

The preanesthetic preparation of the patient and methods of producing local anesthesia and akinesia will be discussed.

A comparison of the merits of local and general anesthesia, emphasizing the advantages and disadvantages of each, will be included.

COURSE 109

Room 716 Period M-5

GUSTAV C. BAHN, M.D.
New Orleans

Orbital Disease

Special anatomic and physiologic features of the orbit render it unique from the standpoint of the pathologic processes

which it may harbor, and the courses that these processes may follow. These processes are generally of two types, inflammations and neoplasms. Primary and secondary inflammations and neoplasms of the orbit are described as to their genesis, clinically diagnostic features and management. Orbital manifestations of systemic diseases are included in the discussion.

COURSE 110

Room 715 Perod W-5

ROBERT E. BANNON
Buffalo
BY INVITATION

Practical Aspects of Multifocal Corrections

This course will review briefly various measurements (amplitude of accommodation, dynamic cross cylinder test, and the method of limits) that are helpful in determining near point corrections. Clinical data supporting the practice of learning half the amplitude in reserve will be presented.

A procedure will be described for determining the proper add for unusual near distances when routine tests have measured the add necessary for a standard near test distance.

Once the amount of the add has been decided upon, it is necessary to select (or advise) the **form** of the lens correction. The factors which should influence a choice of separate near (single vision) glasses, fit-over lenses, bifocals or trifocals will be discussed.

Special attention will be given to the relative importance of image jump, object displacement, field of view with various segment sizes, segment decentration and ranges of clear vision with various adds.

COURSE 111

Room 712 Period T-5

ROBERT E. BANNON
Buffalo
BY INVITATION

Aniseikonia: Its Role in Refractive Problems

Every new correction of refractive errors changes the seeing conditions to which the patient has become accustomed. The magnitude of these changes and the patient's tolerances determine whether or not binocular vision will be comfortable and efficient. Aniseikonia (not equal images) is one condition which may arise. It is most frequently associated with the correction of unequal refractive errors, and in certain cases it can cause persistent discomfort.

A brief review of aniseikonia and space eikonometry will be followed by a discussion of various clues and procedures that are useful in detecting aniseikonia in routine office practice.

COURSE 112

Room 712 Period W-5

OWEN BELMONT, M.D.
Philadelphia

Refraction: Causes of Failure

Failure in refraction is defined as any instance in which a patient rejects his glasses. The most common reasons for such rejection will be analyzed. Case histories will be outlined to illustrate each type of failure. Secondary effects of lenses which change and distort the patient's orientation in his environment will be discussed. Ways of anticipating and minimizing these undesirable defects will be presented.

COURSE 113

Room 736 Period M-6

CONRAD BERENS, M.D.
New York

Cyclodiathermy, Cycloelectrolysis, Iridencleisis and Cyclodialysis

A statistical evaluation of the postoperative results and complications following penetrating and nonpenetrating cyclodiathermy, penetrating and nonpenetrating retrociliary diathermy, cycloelectrolysis and retrociliary cycloelectrolysis in over 1,700 eyes observed for one to fourteen years postoperatively will be discussed.

The postoperative results and complications following iridencleisis and cyclodialysis will be evaluated.

The indications, contraindications and techniques of these procedures will be described.

COURSE 114

Crystal Room Period T-4

CONRAD BERENS, M.D.
New York

Ophthalmic Surgery: Recent Trends

Presentation of a sound film showing the following surgical techniques:

1. Evisceration and enucleation, using hollow mesh-capped plastic implants
2. Lamellar keratoplasty
3. Retinal detachment surgery, utilizing special pins and the application of diathermy
   Scleral buckling in a case where the sclera was too thin and fibrotic for a scleral resection
4. Resection and advancement of the levator for ptosis
5. Tucking of the superior oblique muscle
6. Retroplacement of the superior oblique
7. Subconjunctival closure of cataract wound

COURSE 115

Room 702 Period T-5

JEROME W. BETTMAN, M.D.

San Francisco

Value of Goniotomy

This course is really a practical, thorough, clinical discussion of congenital glaucoma.

The diagnosis, differential diagnosis, and prognosis of congenital glaucoma will be reviewed. Evidence will be presented to demonstrate that goniotomy is the procedure of choice in congenital glaucoma. Each of the modern techniques of goniotomy will be presented. The techniques of goniotomy without visual control, goniotomy with a contact lens, and goniotomy with continuous injection of air will be presented. Their merits will be compared, and the preoperative and postoperative care will be considered. Theories of the method of action of goniotomy will be discussed.

Goniotomy is one of the great surgical advances in modern ophthalmology. It has already saved many from a life of total blindness.

COURSE 116

Room 702 Period W-6

JEROME W. BETTMAN, M.D.
San Francisco

Radioactive Isotopes

This course is designed for the practicing ophthalmologist who wishes to understand radioisotopes better.

The course will consist of (1) a very simple, easily understood explanation of the fundamentals of radioisotopes. Under consideration will be A, B, and G emissions; half life; differences in energy. Conditions under which only pure B emitters are useful in diagnosis and experimental work in ophthalmology will be discussed. (2) A brief consideration of the place and value of radioisotopes in therapy and in diagnosis, including the use and abuse of P^{32} in the diagnosis of intraocular neoplasms. (3) The experimental use of radioisotopes as an indication of the blood volume of the choroid and retina. This shed considerable light on which agents actually dilate the intraocular blood vessels and which agents do not. Deductions of very practical clinical significance will be made.

COURSE 117

Room 711 Period Th-4

HAROLD M. BLOCK, M.D.
Dallas

Office Practice of Ophthalmology

In this course it is my intention to explain various types of office procedures for medical and surgical conditions, with

the patients' reactions in mind, and in such a way as to have better patient-doctor relationships. Procedures learned in the clinics and hospitals will be explained from the viewpoint of their application in private practice. The course is especially designed for the young ophthalmologist.

COURSE 118

Room 710 Period Th-4

G. BONACCOLTO, M.D.
New York

Dacryocystorhinostomy

A review will be made of the various techniques devised and developed for the purpose of re-establishing the nasolacrimal drainage of tears.

The author will discuss and show motion picture demonstrations of the technique which he has devised. A simplified manner of approach to, and exposure of, the lacrimal sac is described together with the use of the Iliff-Stryker trephine to create the osseous opening. The modification of the usual dacryocystorhinostomy procedure involves the insertion of two sizes of polyethylene tubing through the canaliculus and lacrimal sac, which is incised, and then through the osseous perforation, into the nasal cavity. The use of these tubings facilitates the union of the lacrimal sac and nasal mucosal flaps, thus enhancing the creation of a permanent nasolacrimal fistula in a large percentage of cases.

COURSE 119

Room 750 Period W-5

SOLOMON S. BRAV, M.D.
Philadelphia

Diseases of the Choroid

A short history of choroidal detachment will be presented. Discussion of the histopathology and pathogenesis will be considered and a classification of the various types of detachment noted. Various theories of the cause of this condition will be discussed and clarified.

Indications and contraindications for medical and surgical therapy will be dealt with in detail.

COURSE 120

Room 715 Period W-4

ARNOLD S. BREAKEY, M.D.
New York

Rehabilitation in Ophthalmology

This course will deal with the ocular manifestations of damage to the central nervous system in children, teen-agers and adults. The three groups are vastly different one from the other.

In **children** the problem is mainly one of oculomotor imbalance, especially esotropia, complicated by a high incidence of congenital anomalies. Gaze palsy, visual defects, ocular toxoplasmosis, ptosis, and nystagmus are frequently encountered. This group has a great ability to develop new pathways and recover their deficits. Generally accepted principles for ophthalmic care are not applicable to this group. The medical and surgical management will be stressed. Testing for perceptual defects will be discussed.

In **teen-agers** we see the results of childhood brain damage which has gone untreated. The incidence of subnormal vision is high. Exotropia predominates among motor imbalances. Field defects of the hemianoptic variety are frequently seen as well as perceptual defects. Cosmetic surgery is often beneficial.

In the **adult** group, central nervous system damage is most commonly due to cerebrovascular accidents and trauma. The resulting deficiencies are loss of visual field, accommodative insufficiency, ocular imbalance, diplopia, reading problems and optic atrophy. Since the ocular apparatus cannot be made to develop new central pathways by means of passive exercise, we must teach the patients to get along with "what is left." Rehabilitation from the ocular standpoint is most important to the "whole patient" because the handicapped person depends to an extra measure on his eyes. Appliances to facilitate this work will be exhibited. The problem of visual aphasia is a serious one. Its treatment will be discussed.

COURSE 121

Room 702 Period W-4

GOODWIN M. BREININ, M.D.
New York

Electromyography

The principles of electrophysiologic instrumentation as applied to electromyography of the extraocular muscles and to electro-oculography will be described, and the theory and application of these techniques discussed.

There will be a brief review of neuromuscular conduction. Illustrative slides and tracings will be shown of both normal and abnormal conditions involving ocular motility: comitant and paretic strabismus, ptosis, myopathies and nystagmus.

COURSE 121-A

Room 744 Period T-4

JOHN A. BUESSELER, M.D.
Columbia, Mo.

Ophthalmic Radiology: Diagnosis

COURSE 122

Room 738 Period M-6

JORGE N. BUXTON, M.D.
New York

Total and Partial Keratectomies

Indications and techniques for partial keratectomy in primary and recurrent pterygiums with and without limitation of rotation (diplopia); pseudopterygiums and localized corneal scars.

Indications and techniques for total keratectomy preparatory to keratoplasty or for optical or reconstructive reasons. Repair of symblepharons when found associated with the forementioned conditions; repair by conjunctival autoplasty or buccal mucosal graft obtained with scissors technique or by electrical keratotome.

Contraindications to partial and total keratectomies, and the need for partial, total or peripheral lamellar keratoplasty.

Use of beta radiation as an adjunct of keratectomy. Characteristics of different applicators with special reference to dosage, time and frequency of applications; modifications of emission by filters, and complications of overdosage.

Slides and a motion picture will illustrate the material covered.

COURSE 123

Room 716 Period M-4 or T-4

F. PHINIZY CALHOUN, JR., M.D.
Atlanta

Epithelization of the Anterior Chamber: Diagnosis and Treatment

A review of the pathogenesis, incidence, and histopathology of this condition, with detailed discussion of the clinical manifestations and recent developments in diagnostic tests and methods of treatment.

COURSE 124

Room 750 Period M-6

FRANK D. CARROLL, M.D.
New York

Optic Nerve Lesions: Differential Diagnosis

Lesions of the optic nerve must be first differentiated from lesions caused by intracranial expanding lesions and disorders of the macula. Then an etiologic differential diagnosis of the optic nerve condition may be sought. This includes consideration of conditions which are inflammatory, degenerative, vascular, neoplastic, or toxic. An outline of the author's approach to this problem will be presented.

COURSE 125

Room 750 Period T-4 or W-4

J. V. CASSADY, M.D.
South Bend, Ind.

Dacryocystitis and Lacrimal Drainage

Consideration will be given to dacryocystitis, excessive lacrimation, and lacrimal duct obstruction in adults as well

as in infants. Kodachrome illustrations of anatomy, embryology, and pathogenesis of lacrimal drainage problems will be shown. Clinical examination, diagnosis, and treatment will be discussed. Irrigation, probing, palliative treatment, and the use of polyethylene tubing will be considered. A film presenting the Dupuy-Dutemps method of dacryocystorhinostomy will be shown.

COURSE 126

Room 784 Period M-4

J. V. CASSADY, M.D.
South Bend, Ind.

Toxoplasmic Retinochoroiditis

The widespread prevalence of toxoplasmosis in man and animal has caused confusion as to its importance in the etiology of retinochoroiditis. The intelligent treatment of retinochoroiditis should be directed to its cause. Clinical, roentgenologic and serologic study of these patients is mandatory before embarking upon treatment with such dangerous drugs as pyrimethamine and sulfadiazine. Skin tests, blood studies, dye tests and a thorough understanding of the patient must precede therapy directed against toxoplasmosis.

COURSE 127

Crystal Room Period W-4

RAMON CASTROVIEJO, M.D.
New York

Corneal Surgery: Techniques and Results

This course will deal with different types and techniques of keratectomies, keratoplasties and plastic repair of the conjunctiva with or without buccal mucous membrane graft, which may be required for rehabilitation in some complicated corneal operations.

The results will be evaluated in three groups: favorable, in which a high percentage of clear transplants (approximately 90 per cent) and considerable improvement of vision may be expected; partially favorable, in which approximately 50 per cent of the operations are successful; and unfavorable, which do not lend themselves to a successful keratoplasty.

COURSE 128

Room 734 Period T-5

WEBB P. CHAMBERLAIN, JR., M.D.
Cleveland

Vertical and Horizontal Components of Strabismus

The importance of the vertical rotators in relation to horizontal squint will be presented, with particular emphasis on the A and V syndromes in upward and downward gaze. The evidence suggesting that the horizontal recti are the primary causative factors will be considered along with the indications that the obliques or the vertical recti are of basic significance. The diagnosis and treatment of these symmetrical A and V syndromes will be contrasted with the conventional management of vertical and horizontal anomalies not associated with this type of horizontal incomitance in the straight up and straight down positions.

COURSE 129

Crystal Room Period M-4

WEBB P. CHAMBERLAIN, JR., M.D.
Cleveland

Surgery of the Ocular Muscles

COURSE 130

Room 705 Period W-5

MAX CHAMLIN, M.D.
New York

Perimetry: Techniques for Detection of Minimal Defects

Techniques for the detection of minimal defects in visual fields caused by early lesions of visual pathways will be demonstrated. The mounting of test objects on permanent carriers, as well as care of these test objects, will be shown. The choice of test objects and methods of recording various field defects will also be demonstrated. Principles which apply to the tangent screen as well as to the perimeter will be presented, and the interpretation of minimal findings will be explained. Cases in which the use of

the perimeter entirely supersedes the tangent screen, as well as the reverse, will be shown.

COURSE 131

Room 705 Period M-6

MORTIMER R. CHOLST, M.D.
Neponsit, Queens, N. Y.

Central Fields: Methods and Techniques

Attention will be directed to patients with reduced corrected vision. Too often, pathologic changes are assumed to be the causative factor of the diminished vision and result in deferment of a central field recording.

The various methods and techniques presently employed in the mapping of central visual fields will be reviewed and their respective limitations and advantages will be discussed. This discussion will include the tangent screen and campimeter, with additional reference to the procedures employed in stereocampimetry.

Recent methods wherein test objects are not employed, such as those utilizing the Amsler charts and Harrington multiple-pattern screening instrument, will also be demonstrated.

Problems of technique to be reviewed will include a means for rapid determination of the patient's comprehension and ability to maintain satisfactory fixation, so vital to accurate visual fields.

A practical routine for evaluation of the central field in an eye with reduced corrected vision will be presented.

COURSE 132

Room 727 Period Th-4

WILLIAM B. CLARK, M.D.
New Orleans

Surgery of Ocular Muscles

COURSE 133

Room 734 Period M-5

GILBERT W. CLEASBY, M.D.
San Francisco

Iris Tumors

The origin and natural behavior of various types of iris tumors, especially melanomas, indicate that these lesions are different from those arising elsewhere in the uvea. Management of a patient with a pigmented tumor of the iris presents problems as to the criteria for making a diagnosis of malignant melanoma, how best to treat the condition and what may be anticipated in terms of prognosis.

In this course a large series of iris tumors wil be analyzed in an effort to outline and illustrate features of major importance in diagnosis, treatment, and prognosis. Differential diagnosis is often difficult. Lesions and conditions most commonly encountered will be illustrated and discussed.

COURSE 134

Room 750 Period T-6

ROBERT S. COLES, M.D.
New York

Office Management of Uveitis

This course will deal with a practical approach to the office management of uveitis. Chronic and recurring forms and their secondary complications will be included. Theoretical aspects will be largely bypassed for more practical considerations. The extent of the diagnostic workup indicated in the various types of uveitis will be discussed along with those clues that point to a specific diagnosis without further studies.

Therapy of the different forms of uveitis will be reviewed with reference to the management of those in which there is no specific diagnosis. Detailed descriptions of the use of the various therapeutic agents will be presented.

COURSE 135

Crystal Room Period W-6

FREDERICK C. CORDES, M.D.
San Francisco

Congenital Cataract: Selection of Best Surgical Procedure

COURSE 136

Room 733 Period M-6

TULLOS O. COSTON, M.D.
Oklahoma City

Inflammatory and Degenerative Disease of the Retina: Differential Diagnosis and Treatment

The subject matter to be covered will include senile macular degeneration, Kuhnt-Junius' degeneration, central angiospastic retinopathy, and the lesions of tuberculosis and toxoplasmosis. The author's method of handling these conditions will be discussed. Colored lantern slides will be shown illustrating the various conditions.

COURSE 137

Room 712 Period Th-4

JACK P. COWEN, M.D.
Chicago

Pool Gonioscopy: Technique for Simplified Anterior Chamber Visualization

A simple study of the angles of the anterior chamber, particularly in all cases of glaucoma, can be accomplished by a lens-free method of flooding the inner angle of the eye with saline solution and of studying the submerged chamber angle with flashlight illumination and from five to ten power loupe magnification or, better still, with the detached binocular slit lamp head. The method will be demonstrated and discussed.

COURSE 138

Room 711 Period M-6

JOHN C. CUNNINGHAM, M.D.
Burlington, Vt.

Types of Head Pain as Viewed by the Ophthalmologist

The mechanism of head pain will be discussed. The clinical types of headache arising from intracranial, extracranial and paracranial sources will be reviewed. Particular attention will be given to head pain associated with cranial arteritis, migraine and orbital lesions. Lantern slides will be used in the course.

COURSE 139

Room 705 Period W-4

PAUL L. CUSICK, M.D.
Detroit

Ptosis Surgery: Practical Aspects

Blepharoptosis will be classified according to its causation. The various types will be illustrated with lantern slides. The procedures used by the author to correct the various types will be described, and will be illustrated with lantern slides to show the technique.

Overcorrection and its relief will be discussed, and the procedure used for levator recession will be illustrated with lantern slides.

COURSE 140

Room 728 Period T-4

NORMAN L. CUTLER, M.D.
Wilmington, Del.

Cataract: Methods of Extraction

The purpose of this course is to acquaint surgeons with the spoon extraction of cataracts, either as a method of choice or as an alternate procedure. This method has now been used in six hundred extractions.

Operations using alpha-chymotrypsin will be discussed. Spoon extraction seems to be ideally suited to the use of this enzyme. Procedures will be illustrated with slides and motion pictures.

COURSE 141

Room 786 Period M-6 or T-6

LOUIS DAILY, M.D.
Houston

Biomicroscopy of Vitreous and Fundus Oculi

Techniques of examination will be described. The relative values of slit lamps, and of contact lenses and preplaced lenses will be discussed.

The normal and pathologic biomicroscopic appearances of vitreous and and fundus will be illustrated with colored transparencies made in Vienna under the direction of Karl Hruby and in Bern under the direction of Dr. Hans Goldmann. Types of detachment of the vitreous in association with pathologic states such as spontaneous collapse of the vitreous and hemorrhage into the vitreal space will be discussed and illustrated. Other conditions which will be described and illustrated are congenital anomalies of the optic disc and retina, retinitis proliferans, primary and traumatic detachments of the retina, intraocular foreign bodies, melanoma of the choroid, retinal cysts, retinal edema in diabetes and hypertension, macular holes, retinoschisis, and drusen. The clinical significance of these biomicroscopic observations will be discussed.

COURSE 142

Room 715 Period Th-4

ALAN DAVIDSON, M.D.
New Bern, N. C.

Surgical Instruments: Preparations and Care

This discussion is designed for those ophthalmologists practicing in general hospitals who do not have nurses especially trained to care for ophthalmic surgical instruments. Mention will be made of the manufacture, materials, and choice of surgical instruments as well as their sterilization, preparation and care.

COURSE 143

Room 750 Period T-5

FREDERICK J. DAVIS, M.D.
Madison, Wis.

Sutures in Catract Surgery: Types and Uses

The usefulness of sutures of some type for firm closure of the cataract incision is now universally recognized.

Among cataract surgeons there is a wide variation in techniques in placement of these sutures, as well as in the type of suture material, needles, etc.

This discussion will touch upon these varying techniques and materials and will present some of the methods of closure used by various surgeons. There will be a discussion of conjunctival and scleroconjunctival sutures, corneal and corneoscleral edge-to-edge or "border to border" sutures inserted through the lips of the wound, overriding corneoscleral and episcleral, and track sutures; buried surgical gut; preplaced and postplaced sutures; and suture removal.

COURSE 144

Room 777 Period M-5

ROBERT M. DAY, M.D.
New York

Medical Exophthalmos: Diagnosis and Treatment

The clinical concept of this orbital process, gained from observations in a large thyroid clinic, will be discussed. Terminology, symptoms, signs, course, differential diagnosis and treatment will be presented. The variable clinical picture will be especially emphasized, for the recognition of this condition is most important not only from the point of view of management but also in the evaluation of any form of treatment.

COURSE 145

Room 728 Period M-4 or W-4

A. GERARD DeVOE, M.D.
New York

Surgery of Trauma

The principles and techniques most useful in handling injuries of the eye and adnexa will be discussed. Typical cases will be demonstrated by still and motion picture projection.

COURSE 146

Crystal Room Period T-6

A. GERARD DeVOE, M.D.
New York

Acute Surgical Lesions

COURSE 147

Room 750 Period M-4

SAMUEL M. DISKAN, M.D.
Atlantic City

Eye Screening in Schools

The nationwide effort to discredit the medical profession and ophthalmologists by charging that vision testing in schools has been and still is inadequate urgently requires that we (ophthalmologists) do something to remedy this situation.

The course will present:

1. The nationwide problem of school vision testing
2. How to go about setting up a school vision screening program
3. Normal standards of vision for school children
4. Eye tests which lend themselves to mass screening techniques
5. Demonstration of visual screening techniques and equipment

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COURSE 148

Room 702 Period M-5

JAMES R. DUKE, M.D.
Baltimore

Lesions of the Lids:
A Clinical-Pathologic Survey

The more commonly encountered lesions of the lids will be surveyed from the following aspects: relative incidence of occurrence, clinical manifestations, criteria of differential diagnosis, and histopathologic characteristics. Kodachrome slides will provide a direct correlation of the clinical appearance of the lesion with the underlying histopathologic process.

COURSE 149

Room 724 Period M-5 or T-5

EDWARD A. DUNLAP, M.D.
New York

Divergence Anomalies

These anomalies consist of divergence excess and divergence insufficiency. Each is characterized by certain specific findings that serve to differentiate it from an anomaly of convergence. In the Duane classification of strabismus they are in the group of Anomalies of Dysjunctive Movements. They are nonparalytic.

Methods of diagnosis, characteristic findings, and typical case measurements will be presented for each form. A vertical component is frequently a complicating factor. Differentiation from the A-V syndromes will be brought out.

Treatment, both conservative and surgical, will be outlined. Tabulated results of a study on 247 cases will be presented, including 138 cases that have been surgically treated, with at least one year of follow-up.

COURSE 150

Room 716 Period W-4

EDWARD A. DUNLAP, M.D.
New York

Accommodative Esotropia: Treatment

This specialized form of esotropia has many facets. There are two types, and they are differentiated by basic findings and distinctive features. Establishment of the diagnosis will be discussed in some detail. This is important because surgical intervention is almost invariably contraindicated in this type of esotropia.

General aspects of management will be covered. Treatment in the past has been almost solely with glasses, but the use of miotics, or "peripheral accommodation stimulators" such as DFP (Floropryl) and Demecarium bromide (BC-48), is rapidly increasing. Indications and contraindications for use of these drugs in the two forms of squint will be discussed. Case reports selected from a group of over a hundred patients so treated will be presented.

COURSE 151

Crystal Room Period W-5

JOHN H. DUNNINGTON, M.D.
New York

Some Problems of Cataract Extraction

COURSE 152

Room 706 Period Th-4

DAVID J. EDWARDS
Chicago
BY INVITATION

Abnormal Effects of Prescribed Lenses on Extrinsic Muscles

This course will deal with the value of testing the vergences and the phorias, and with the correlation of the two. Simple rules employing the Prentice law of light divergence and its application to evaluating extrinsic anomalies, and the reason improperly fitted lenses create abnormal extrinsic muscle conditions, will be emphasized.

In addition to image size disparity, anisometropia will be dealt with in the field of prismatic effects caused by lenses of unequal foci.

The problems of binocular vision in the patient requiring lower power lenses will be given thorough consideration.

Aphakia and its binocular problems will be discussed with special attention to asthenopia in bilateral corrections.

Alleviation of asthenopia by prescribed lenses in the average presbyope will be considered.

Oblique cylinders will be discussed in their relation to induced vertical and lateral phorias.

Slides and drawings will be used to illustrate points of importance.

COURSE 153

Room 777 Period T-4

JOHN A. EGAN, M.D.
Denver

Cross Cylinder: Application and Theory

The use of the cross cylinder as taught by Edward Jackson will be discussed. Improved models will be shown and uses devised since Jackson's time will be described.

Lantern slides will exhibit practical application of the cross cylinder. Large 2-foot models of the cross cylinder, trial cylinder and trial frame will be used to demonstrate general technique for use in refraction. Twelve different uses of the instrument, including the employment of the newer correcting cross cylinder, will be described.

A brief discussion of theories involved in the cross-cylinder method will be presented, and controversial aspects will be discussed. This method of testing for astigmatism will be contrasted with other methods.

COURSE 154

Room 750 Period M-5

ORWYN H. ELLIS, M.D.
Los Angeles

Removal of Intraocular Foreign Bodies

A description of special techniques for relocalization of intraocular foreign bodies not successfully removed at the first attempt will be presented. The importance of the history and careful roentgenographic localization will be emphasized. There will be a detailed demonstration of methods for expediting removal of foreign bodies of the anterior chamber and ciliary body areas.

COURSE 155

Room 733 Period M-4

WILLIAM G. EVERETT, M.D.
Pittsburgh

Retinal Detachment: Selection of an Operation

The author will review the basic operations for retinal detachment, discussing the advantages and disadvantages of each procedure.

The four basic operations utilized by the author will be described and illustrated. The rationale for selection of an operation for retinal detachment will be exemplified with case histories, fundus photographs and fundus diagrams. Complications at surgery and postoperatively will be discussed.

The use of the Zeiss photocoagulator as a primary procedure and in conjunction with conventional surgery will be represented with accompanying slides.

COURSE 156

Room 777 Period W-5

HAROLD F. FALLS, M.D.
Ann Arbor, Mich.

Ocular Geriatrics

A comprehensive survey of the ocular changes and disease states associated with senescence will be presented. When possible, a differentiation will be made between universally occurring disease states in the aged eye and those disease processes appearing in senescence but having no direct relationship to the passage of time.

Treatment, care, and management of the senile eye and individual will receive consideration.

COURSE 157

Room 777 Period T-5

HAROLD F. FALLS, M.D.
Ann Arbor, Mich.

Clinical Manifestations of Constitutional Syndromes Involving the Head and Neck

This course will deal with the hereditary constitutional syndromes which exhibit anatomic and pathologic ophthalmic manifestations. The ocular changes associated with these entities will be emphasized and illustrated. The entire purpose of the course is to emphasize the role of the ophthalmologist as a doctor of medicine and his responsibility to his patients in the line of current teaching—namely, that of considering the patient as a "whole individual."

The course material will include discussion of the mucocutaneous syndromes, the ocular manifestations of the renal tubule reabsorption dysplasias, the syndromes exhibiting marked aberration in the development of the facial skeleton and lastly the syndromes exhibiting diagnostic retinal changes easily identified by the ophthalmoscope.

COURSE 158

Room 702 Period M-4

RICARDO F. FERNANDEZ, M.D.
San Juan, Puerto Rico

Beta Radiation in Pterygium Surgery

1. Brief outline of history of pterygium and its treatment.
2. Etiology, histology, symptomatology and indications for surgery.
3. Brief discussion of most widely used techniques, with statistics covering over 900 cases.
4. Beta radiation following pterygium surgery, with statistics covering over 350 cases treated in the last four years. Comparison of results with previous methods.
5. Complications of pterygium surgery, including those treated with beta radiation and soft x-rays.
6. Presentation of kodachrome slides illustrating results and complications.
7. Short color film illustrating our present surgical technique with application of beta radiation.

COURSE 159

Room 733 Period M-5

OLGA FERRER, M.D.
Vedado, Havana, Cuba

Contact Lenses

Practical application of contact lenses in surgery, as a diagnostic aid, and in the correction of optical defects will be presented. Attention will be given to problems arising in office practice regarding the indication for contact lenses, selection of type of lens, and fitting techniques.

Ophthalmometric reading, refraction, and fluorescein pattern are used as the basis for the prescription of the lens. Fitting time and wearing time will be discussed.

COURSE 160

Room 777 Period M-6

WALTER H. FINK, M.D.
Minneapolis

Binocular Problems in Routine Refraction

Although the correct selection of lenses solves most of the refractive problems, there remains an appreciable number of cases in which a binocular problem is present to some degree. Because of this, a routine study of the binocular efficiency of all refraction cases is indicated. Although some require a minimum of study, others require an extensive analysis of the binocular function for proper evaluation.

In the presentation, the steps in the investigation of binocular efficiency as carried out in routine refraction are evaluated and the various problems encountered are discussed, particularly the association between heterophoria and the fusional reflexes.

COURSE 161

Room 738 Period T-6

WALTER H. FINK, M.D.
Minneapolis

Vertical Muscle Surgery

A. Indications for Vertical Muscle Surgery
   1. As applied to the vertical muscles as a whole
   2. As applied to one or more vertical muscles
   3. As applied to combined vertical and horizontal muscle problems

B. Surgical Procedures
   1. Anatomic factors which determine surgical techniques
   2. Description of various surgical procedures

C. Complications Resulting from Improper Management

COURSE 162

Room 743 Period W-4

SIDNEY A. FOX, M.D.
New York

Senile Ectropion and Entropion

Operative procedures best adapted for the correction of various clinical types of mild and severe senile ectropion and entropion will be considered and the reasons for each choice explained. The steps in the different techniques of surgery will be systemically outlined.

The modern theories of the etiology of senile ectropion and entropion and the evolution of the surgical techniques will be discussed in brief.

COURSE 163

Room 778 Period M-4

WILLIAM C. FRAYER, M.D.
Philadelphia

Retained Lens Protein After Operation and Trauma: Recognition of Danger and Treatment

The several mechanisms by which lens protein may contribute to prolonged inflammation following ocular operations and trauma will be discussed. The relative importance of infection, allergy and simple foreign body reactions in such eyes will be evaluated. Clinical and histologic features of lens protein reactions will be illustrated by lantern slides. On the basis of observations made from these presentations, suggestions will be made for a rational approach to clinical management.

COURSE 164

Room 784 Period T-4

BERNARD FREAD, M.D.
New York

Ideal Refraction Equipment: Survey of Instruments Used

Refraction is most important in the daily routine of every ophthalmologist. A good part of each working day is spent with details of refraction and not enough emphasis has been placed upon the tools necessary to make refraction easier, more accurate, and less time consuming.

Every major refraction instrument manufactured in the United States and in the larger optical plants of England, France, Germany, Italy, Japan and Switzerland will be discussed. About two hundred lantern slides will graphically illustrate this equipment.

Attention will be given not only to elementary equipment used by the beginner but also to elaborate devices used for the objective and subjective measurement of refraction of particular interest to the experienced ophthalmologist.

The name, function, manufacturer, and current cost of the various instruments will be reported.

COURSE 165

Room 778 Period T-6

WILFRED E. FRY, M.D.
Philadelphia

Inflammatory and Degenerative Lesions at the Posterior Pole of the Eye: Differential Diagnosis

Not only must a differential diagnosis be made between inflammatory and degenerative lesions at the posterior pole of the eye but these conditions must also be distinguished from malignant lesions. The factors governing diagnosis of malignant lesions at the posterior pole of the eye will differ from those governing diagnosis of lesions in the midzone or in the anterior segment. When the lesion is in the midzone or the anterior segment, distinction must be made between a serous and a solid detachment. When the lesions are in the posterior segment, the diagnosis must be made upon the ophthalmoscopic appearance plus all other information that can be afforded by a complete examination of the patient.

The situation is different when the macula alone is involved, or when the region of the disc is involved.

Types of lesions as they involve the macula and the perioptic region will be illustrated and the management discussed.

COURSE 166

Room 784 Period T-5

SAMUEL GARTNER, M.D.
New York

Fundus Diseases: Clinical and Pathologic Correlations

The fundus pictures in many diseases will be correlated with the clinical course of the disease and essential pathologic findings. Numerous photomicrographs of eyes obtained at autopsy will demonstrate the vascular diseases, blood dyscrasias, diabetes, and a number of neurologic disorders, including papilledema, optic neuritis, multiple sclerosis and the chiasmal syndrome.

COURSE 167

Room 705 Period T-6

J. CONRAD GEMEROY, M.D.
Detroit

External Diseases

This lecture on external eye diseases, their diagnosis and treatment, is illustrated with kodachrome slides to show the usual, as well as some unusual, diseases of the lids, conjunctiva, and cornea. These illustrations will be projected stereoscopically in color on the screen.

COURSE 168

Room 743 Period M-6

HAROLD GIFFORD, JR., M.D.
Omaha

Local Anesthesia with Special Reference to Deep Motor Block

The methods of producing complete ocular anesthesia as well as complete motor block of the extraocular muscles will be discussed. The anatomy of the orbit with reference to the nerves and blood vessels will be reviewed in detail. The technique will be described with slides and motion pictures. This technique produces a long-lasting anesthesia and reduces the pressure on the globe from the extraocular muscles. This is important to prevent vitreous loss and has proved valuable in strabismus and retinal surgical procedures.

COURSE 169

Room 784 Period M-5 or T-6

JOHN F. GIPNER, M.D.
Rochester, N. Y.

Recent Advances in Ophthalmic Surgery

This lecture will include discussions of perpendicular incisions versus shelv-

ing incisions in cataract surgery; choice and number of sutures for tightly closing the cataract section; advantages of gut suture; intravenous sedation; use of alpha-chymotrypsin; anterior chamber lenses and corneal lenses.

The newer techniques in glaucoma surgery, including the use of scleral cautery in several procedures, will also be considered.

COURSE 170

Room 716 Period M-6

GEORGE M. HAIK, M.D.
New Orleans

Mechanics of Intracapsular Cataract Extraction

The primary objective of cataract surgery is to deliver the lens by a technique which is at the same time simple and safe, and which is attended with a minimum of postoperative complications. In spite of the numerous improvements which have been introduced, a technique which meets all of these criteria has not yet been found. On the contrary, all of the techniques now employed are sometimes associated with serious hazards and may be followed by serious complications.

For many years intracapsular extraction has been the preferred technique of cataract surgery. One reason, perhaps, that it is not yet as satisfactory as it might be is that too little attention has been paid to the preliminary steps of releasing the lens from its attachments and its subsequent subluxation. When these steps have been accomplished properly, without rupture of the lens capsule, the remaining steps of the operation are usually relatively easy.

COURSE 171

Room 744 Period W-6

G. PETER HALBERG, M.D.
New York

Tear Formation: Clinical Problems

Anatomy and physiology of the lacrimal system will be presented. Tear formation, the function and purpose of tears, and their chemical composition will be discussed. Theory and practice of the Schirmer test will be discussed and its application demonstrated. Paper-electrophoretic method of tear analysis will be presented. Clinical problems arising from underproduction and overproduction of tears will be emphasized. Sjogren's syndrome will be discussed in detail. Special attention will be directed to the "borderline dry eye," a problem which may not be easily recognized. Special reference will be made to contact lens problems and the role of tear fluid in contact lens tolerance. Pathology of the lacrimal punctum will be discussed.

Lectures will be illustrated by kodachrome slides, photographs, and practical demonstrations of the different testing methods.

COURSE 172

Room 711 Period W-4

THOMAS R. HEDGES, JR., M.D.
Philadelphia

Neuralgias of the Head: Treatment

This subject, important in the daily practice of our specialties, concerns, primarily, a proper evaluation and classification of head pain with relation to its fundamental mechanisms. Once a clear outline of their differential diagnosis and origins is presented, all the neuralgias of the face, both typical and atypical, as well as other types of vascular headaches and head pain from other causes, can be treated intelligently. Each year new methods of diagnosis and treatment appear in the literature. These will be covered in detail with particular aim toward the practical office management of these problems.

COURSE 173

Room 744 Period M-6

JOHN W. HENDERSON, M.D.
Ann Arbor, Mich.

Intracranial Arterial Aneurysms: Ophthalmic Findings

The ophthalmic findings of arterial aneurysms of the circle of Willis will be discussed on the basis of a series of 119 cases studied at the University of Michigan. Cranial nerve involvement, visual symptoms and findings, and funduscopic findings will be analyzed. Case summaries and arteriograms of pertinent patients will be noted. The importance of the ophthalmologist's early awareness of such a diagnosis is stressed.

COURSE 174

Room 721 Period Th-4

HOWARD F. HILL, M.D.
Waterville, Maine

Cataract Surgery:
Keratome and Scissors Technique

Incision and closure of the cataract wound will be discussed, with special reference to certain advantages in using the keratome and scissors. Emphasis will be placed upon many small details that are occasionally overlooked, each one of which is important in perfecting this technique.

Proper use of special instruments will be discussed. New developments in wound closure and improved methods in suture technique especially adapted to this method will be described.

Slides and motion pictures will be used in describing this new technique, including zonulolysis.

COURSE 175

Room 778 Period M-6

WILLIAM T. HUNT, JR., M.D.
Philadelphia

Problems in Accommodation:
Finding of Near Point

The distant refractive state will first be considered. Balancing the refraction for distance and near is a concern. Factors which may modify the distant correction for use at near points, such as accommodation, phoria and other findings will be evaluated in their relationship to each other. The use of the cross cylinder at near, including its use with grid charts and the red-green lantern findings are to be discussed.

COURSE 176

Room 784 Period M-6

JERRY H. JACOBSON, M.D.
New York

Clinical Electroretinography

The change in the electrical status of the retina when it is functioning can be detected and recorded by the relatively simple technique of electroretinography. The test has been shown to be of value in the early diagnosis of retinal degenerations, in retinal detachment, and in evaluation of the status of a retina obscured from ophthalmoscopic view by cataract, vitreous or corneal opacity.

This course will include a description of the technique of the test, with emphasis on the facility with which it can be performed in almost any hospital, and a discussion of present and future applications. A motion picture will illustrate the actual technique. The related electrophysiological technique of electromyography will also be discussed.

COURSE 177

Room 778 Period W-4

CHARLES E. JAECKLE, M.D.
East Orange, N. J.

Nonstrabismic Abnormalities of Binocular Vision: Diagnosis and Treatment

Accommodation and vergence in terms of stimulus-response mechanisms will be reviewed. With this physiologic background, a clinically useful classification of nonparalytic oculomotor abnormalities will be presented. The role of accommodation and fusional deficiencies in relation to heterophoria and comfortable binocular vision will be stressed. Emphasis will be on the problems encountered daily in every ophthalmologist's office.

Specific signs and symptoms of nonstrabismic disturbances of binocular vision will be indicated. With the aid of

basic office refraction equipment, simple but effective methods of diagnosis and treatment will be demonstrated.

COURSE 178

Room 796 Period W-6

ARTHUR J. JAMPOLSKY, M.D.
San Francisco

Ocular Divergence: Management

Anomalies of divergence follow a general pattern of exophoria, intermittent exotropia at distance, intermittent exotropia at distance and near, and constant exotropia. The importance of suppression, both axial and hemiretinal, is paramount in proper surgical or orthoptic management. The prognosis and methods of treatment (optical, orthoptic, and surgical) differ markedly in exophoria, intermittent exotropia, and constant exotropia. The function of fusional divergence is to be differentiated from the passive and active factors producing intermittent and constant exotropia. The sensory and motor mechanisms in divergence anomalies differ in visually young and visually adult patients, and the management should be modified accordingly.

COURSE 179

Room 784 Period W-4

FRED JOBE
Rochester, N.Y.
BY INVITATION

Ophthalmic Instruments: Practical Information

The efficient use of an instrument depends to a large extent on its maintenance and adjustment. A knowledge of the performance that can be expected is basic in the proper use of any instrument. This course is designed to give the ophthalmologist a better understanding of his equipment. The fundamental design and construction of the commonly used instruments will be discussed. The material will include ophthalmoscopes, retinal cameras, slit lamps, refractors and keratometers.

COURSE 180

Room 795 Period T-6

CARL CORDES JOHNSON, M.D.
Boston

Ptosis

The selection of the proper operation for a given case of ptosis is the theme of this course.

Ptosis will be classified into its various categories, with particular emphasis on congenital ptosis. The part played by associated anomalies will be stressed.

Various types of operations will be considered, with particular emphasis on the lecturer's method of levator resection as done through a skin incision. The course will be illustrated by slides and a motion picture.

COURSE 181

Room 777 Period W-6

HAROLD H. JOY, M.D.
Syracuse, N. Y.

Chronic Glaucoma: Surgical Management

The object of this course is to present in a practical manner the indications and contraindications for surgical intervention, the proper choice of operation, the various standard techniques, the handling of operative and postoperative complications, and the procedures to be used when reoperation is necessary.

The dangers and disadvantages of surgical intervention are analyzed, as are the salient features which should determine whether or when an operation is indicated. Particular attention is paid to selecting a procedure which will best meet the needs of the case at hand with special reference to the condition of the chamber angle. The standard techniques are discussed in detail, including modifications, safety measures, complications, and reoperations.

COURSE 182

Room 786 Period W-6

KELVIN A. KASPER, M.D.
Philadelphia

Dacryocystorhinostomy

A modified version of the Mosher-Toti operation, which requires no suturing of the lacrimal sac to the nasal mucosa, will be demonstrated. The regional anatomy, the various structures encountered, the limits of safety, and the methods used to prevent later closure will all be considered. Preoperative preparation, exact technique of local anesthesia and postoperative care will also be outlined.

A film in color will show the entire operation. Enlarged paintings of the various steps will also be shown.

COURSE 183

Room 784 Period W-5

DEWEY KATZ, M.D.
Hartford, Conn.

Ophthalmic Anatomy: Clinical Significance and Application of Recent Advances

This course will be devoted to a presentation and discussion of recent advances in the realm of ocular anatomy and histology, the clinical significance of such advances, and the important clinical applications of some of the lesser known anatomic facts as well as a few of the well established ones. The anatomic basis for a number of clinical entities and the practical surgical import of some unusual anatomic facts will be discussed.

COURSE 184

Room 731 Period W-6

I. HERBERT KATZ, M.D.
Syracuse, N. Y.

Common Eye Diseases of Dogs and Their Therapy

The following points will be considered: (1) medicolegal aspects, including relationship of doctors of medicine and veterinarians; (2) external diseases, including injuries, melanotic keratitis, keratomalacia, ulcers and other corneal affections; (3) glaucoma, cataract, and fundus diseases.

The presentation will be illustrated by numerous colored slides and emphasis will be placed on the differences between human and dog conditions.

COURSE 185

Room 706 Period W-4

THOMAS P. KEARNS, M.D.
Rochester, Minn.

Unusual Neurologic Motor Anomalies: Clinical Diagnosis

A number of the more unusual motor anomalies of a neurologic nature are discussed. Emphasis is placed on the unusual anomalies to enable the ophthalmologist interested in neuro-ophthalmology to acquaint himself better with all forms of extraocular movement disorders. Chronic, progressive external ophthalmoplegia, aberrant regeneration of the third nerve, skew deviation, nystagmus retractorius, "doll's eyes" movements and oculogyric crisis are included in the conditions discussed. A motion picture will illustrate the various conditions.

COURSE 186

Room 781 Period T-5

ROSCOE J. KENNEDY, M.D.
Cleveland

Ocular Manifestations of Systemic Diseases

Many systemic diseases have characteristic ocular manifestations. Every ophthalmologist should be familiar with these for better recognition and handling of these cases. Any and all parts of the eye may be involved by many of these diseases.

The recognition of some of the more common systemic diseases by their ocular manifestations will be discussed; e.g., hyperthyroidism, syphilis, tuberculosis, diabetes mellitus, blood dyscrasias, vascular occlusions.

Other less common diseases, such as lupus erythematosus, sarcoidosis, brucellosis, tularemia, myasthenia gravis, and Wilson's disease, will be reviewed.

Colored slides will be used to demonstrate the various manifestations.

COURSE 187

Room 777 Period W-4

JOHN HARRY KING, JR., M.D.
Washington, D. C.

Lamellar Corneal Transplantation

Nonpenetrating keratoplasty is important to every ophthalmologist because of its wide applications in many aspects of corneal pathology. According to Magitot, this technique "can be used with success in 75 per cent of the cases where perforating keratoplasty is used today." It is a much safer procedure than penetrating transplantation and should therefore be preferred where benefit can be expected. The indications for its use will be discussed, including optical, preparatory, therapeutic, and miscellaneous. Diagnostic and examination methods will be described. Surgical techniques, instrumentation, complications, postoperative care, and donor materials will be discussed. Emphasis will be placed upon the application of this method in the treatment of common corneal conditions. Colored slides and motion pictures will illustrate the lecture.

COURSE 188

Room 744 Period Th-4

JOHN HARRY KING, JR., M.D.
Washington, D. C.

Transplantation of Preserved Ocular Tissues

Donor eye tissues are often not available to meet the increased demands occasioned by recent progress in ocular surgery. This is particularly important when tissues are needed for emergency use.

Corneas can be preserved in long-term storage for successful use in lamellar keratoplasty. The methods in current use are (1) freezing after pretreatment with glycerin, and storage in the frozen state, (2) freeze-drying (lyophilization) and storage sealed in a vacuum at room temperature and (3) dehydration in glycerin and storage in vacuum at room temperature. Each method will be described and the techniques of utilizing preserved corneas will be shown.

The various uses for which sclera can be preserved will be described. Vitreous preservation in lyophilized form and its implantation in retinal detachment and transplantation in patients with cloudy media will be discussed and illustrated.

COURSE 189

Room 727 Period T-6

BERTHA A. KLIEN, M.D.
Chicago

Clinical Pathology of the Retina

The clinical manifestations of a diseased retina and pigment epithelium, and the pathogenesis of retinal disease in general will be discussed prior to a demonstration of the specific findings in a selected group of such diseases. Special emphasis will be placed upon the diagnosis of functional, inflammatory, and degenerative lesions of the macula lutea and on their differential diagnosis with relation to melanotic tumor, where this question arises.

COURSE 190

Room 795 Period M-6

ABRAHAM L. KORNZWEIG, M.D.
New York

Clinical Embryology

A study of the embryology of the eye has many practical values for the ophthalmologist. It enables him to understand the structure of the eyeball by seeing how it developed. This helps him to appreciate the functioning of the different parts of the globe. Above all, it aids in the differentiation of defects in the eye due to developmental and hereditary causes from those due to environmental conditions.

A series of slides will be shown demonstrating critical periods in the development of the human eye. Special atten-

tion will be given to abnormalities of the eye; congenital cataracts; congenital hydrophthalmos; typical colobomas of the iris, choroid, ciliary body and optic nerve; aniridia; microphthalmia; abnormalities of the optic disc; congenital defects in the retina; and retrolental fibroplasia.

COURSE 191

Room 706 or Room 705 — Period T-5 or Period W-6

BERNARD KRONENBERG, M.D.
New York

Practical Ocular Therapeutics

This course will present therapeutic measures for the most common and frequent ocular problems. Diseases of the cornea, uvea, vitreous and retina will be discussed. The course will also delineate the limitations of our knowledge in the therapy of some of the baffling diseases. An attempt will be made to keep the discussion on a practical level.

COURSE 192

Room 736 — Period W-6

PETER C. KRONFELD, M.D.
Chicago

Present Trends in Ocular Pharamacology

Of the many current clinical or laboratory investigations pertaining to the use of drugs in ophthalmology, the following are outstanding because of their actual or potential practical applications:

1. Investigations into the mechanism of the action of epinephrine upon the ciliary body, correlated with clinical trials of the drug in different types of glaucoma
2. Comparison of the bactericidal properties of polymyxin and colimycin and its derivatives in experimentally infected laboratory animals
3. Clinical trial of the new fungicides suitable for systemic use
4. Clinical trials of new enzymes such as fibrolysin in thrombophlebitis

COURSE 193

Crystal Room — Period M-6

PETER C. KRONFELD, M.D.
Chicago

Medical Management of Eye Lesions Resulting in Increased Pressure

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COURSE 194

Room 744 — Period W-5

BRENDAN D. LEAHEY, M.D.
Lowell, Mass.

Corneal Transplantation

Practical points in preparatory surgery and therapy, operative techniques, and complications will be stressed, with special emphasis on current trends in graft fixation. The author's preplaced track suture method will be described. With this technique, silk sutures are inserted, running 1 mm. on each side of the trephine mark. These are stained with methylene blue and pulled through, leaving blue tracks for the subsequent direct sutures. Corresponding preplaced sutures are inserted in the graft with the aid of a plastic turret-style holder. For grafts up to 6 mm. in diameter, overlying sutures are also utilized.

The lecture will be illustrated by a series of eighty-five slides and a short motion picture, with sound, of one operation.

COURSE 195

Room 733 — Period T-4 or W 4

PLACIDUS J. LEINFELDER, M.D.
Iowa City

Perimetry and Use of the Tangent Screen

A discussion of the relative values of perimetry and tangent screen in the examination of patients with neurologic diseases and glaucoma. Exceptions will be pointed out.

Description of the technique used for each method is given and the importance of the use of proper test objects is explained.

COURSE 196

Room 743 Period W-5

ROBERT W. LENNON, M.D.
Joliet, Ill.

Angle Closure Glaucoma: Therapy

The therapy of angle closure glaucoma will be divided into medical and surgical categories. Medical treatment will be discussed from the standpoint of local and oral medication. Special reference to the pharmacologic and physiologic actions of all the drugs employed in angle closure glaucoma will be made. Parasympathomimetic and sympathomimetic agents will be reviewed. Miotics will be classified and their physiologic action on the pupil described. A review of Diamox will be given, and this drug's role in treatment will be explained.

Surgical intervention in angle closure glaucoma will be discussed with special reference to the types of operations as well as to the timing of the procedures.

The lecture will be supplemented by the use of colored slides.

COURSE 197

Room 744 Period T-5

IRVING H. LEOPOLD, M.D.
Philadelphia

Advances in Ophthalmic Therapy

Experience with old and new drugs affords the ophthalmologist the opportunity to properly evaluate their therapeutic measures. The undesirable side effects of some drugs are discovered when the drug is tried; with others these effects become evident only with the passage of time and accumulation of experience.

During the past year, several new antibiotics and chemotherapeutic agents have been introduced. Prophylactic therapy in intraocular surgery has come under careful scrutiny, and the importance of fungi as well as bacteria, as potential invaders after surgery requires accurate analysis.

The latest medications in glaucoma have many interesting physiologic and pharmacologic aspects. Their proper position in therapy and the method of selection for therapy have to be based on experience of the last few years. In the past year, several new steroids have been introduced and evaluated. Fibrinolytic agents and new anticoagulants are being evaluated for ocular vascular accidents and fundic lesions.

Degenerative diseases have attracted attention from a therapeutic standpoint. These new therapies have created new problems. The ophthalmologist should be stimulated to review his therapeutic approach to each disease.

COURSE 198

Room 744 Period M-4

IRVING H. LEOPOLD, M.D.
LEONARD APT, M.D.
Philadelphia

Chemotherapy

Chemotherapy in ophthalmology includes treatment with those agents which are anti-infective; those which act against neoplasms; and those which have a vascular effect, either on the wall of the vessels or in the contents of the vessels. It is well understood that most of these agents act either as inhibitors of enzymes or by localizing on a specific receptor on an infected organ. Many of these agents will work in combinations. Such combinations may be synergistic, additive or antagonistic, or they may be indifferent to one another. There appears to be a definite relationship between chemical structure and biological action in some compounds. There are many questions relating to the inherent connection of solubility and diffusability of the drug with its penetration of tissue and eventual combination with the biologic system.

Dosage schedules have to be known for children as well as for adults, and it is imperative that for the proper action of each drug, the preferred method of administration be employed as well as the proper dosage. Evaluation of new agents is a must for every practicing physician, for he must be in a position to evaluate each new agent which he intends to use.

COURSE 199

Room 781 Period T-4

CECIL W. LEPARD, M.D.
Detroit

Eye Diseases Common to Children

Those ocular diseases occurring primarily in children constitute a group of special interest to the ophthalmologist, particularly when the method of examination or the differential diagnosis differs from that for those diseases in the adult. The technique and results of examination of premature infants will be discussed. The following syndromes will be discussed: neuroblastoma, chloroma, Schueller-Christian's disease, and eosinophilic granuloma. The discussion will be illustrated by lantern slides showing photomicrographs and findings in the eye and orbit.

COURSE 200

Room 726 Period T-6

IRVING LEVY, M.D.
Trenton, N. J.

Practical Uses of Contact Lenses

Today contact lenses have more than hurdled the bridge of vanity into the realm of function. Every ophthalmologist must be aware of the indications for contact lenses. He should also be acquainted with the different makes and types of contact lenses. Whether he personally fits or does not fit contact lenses, he should be able to recognize the elements of a successful contact lens fitting. He should also be able to recognize the reasons for discomfort and failure in contact lens fitting. These fundamentals along with the technique of contact lens fitting will be discussed in this course.

COURSE 201

Room 726 Period W-6

J. EARL LEWIS
Chicago
BY INVITATION

The Practical Use of Mechanical Visual Aids in the Poor Sighted

Mechanical aids available to the ophthalmologist through his optician for patients requiring subnormal vision aids will be discussed.

Case histories will be presented to illustrate practical application in this connection.

There is evidence which supports the assertion that subnormal vision aids are rehabilitating a substantial number of patients to a more self-reliant and useful life.

COURSE 202

Room 705 Period Th-4

JAY G. LINN, JR., M.D.
Pittsburgh

Evaluation of the Patient for Surgery in Open Angle Glaucoma

Recent advances in medical treatment of glaucoma have made surgery for this condition less frequently necessary. When surgery is required, great care must be taken in the selection of the operation.

There are many factors which must be considered in the individual case. They are found only by a thorough examination of the eye. Age, general health, and race sometimes influence the choice of procedure, as does the condition of the conjunctiva, cornea, iris and lens. The decision for the type of surgical operation to be used is reached only after careful consideration of all the known factors. There is no routine filtering operation for all open angle glaucomas.

The techniques involved in the various surgical procedures for open angle glaucoma will be considered in selection of the surgical operation. The operations will be discussed from this point of view.

COURSE 203

Room 726 Period W-4

RALPH I. LLOYD, M.D.
Brooklyn

Fundus Lesions of the Senile Eye

A number of fundus conditions seen in the macular area of aging eyes have been rated as entities but are really stages of a process resulting from the effects of time upon the elastic tissues of the lamina of Bruch and the choroidal vessels. The earliest phase is seen frequently in the eyes of older persons as an atrophy of the choroidal pigment exposing the sclerotic choroidal vessels. If the condition progresses, subretinal hemorrhages and exudate occur, with Coats's disease, disciform degeneration of the macula and angioid stripes as the final phase. Some of these lesions must be differentiated from metastatic lesions and tumor. As few of these eyes come to the laboratory, study of these lesions through the various stages is important.

COURSE 204

Room 716 Period T-6

JOHN CHENAULT LONG, M.D.
Denver

Retinoblastoma and the Pseudoretinoblastomas: Differential Diagnosis

Familiarity with the clinical features of retinoblastoma will make it easier to differentiate between this and other confusing ocular disorders of childhood. The characteristics of retinoblastoma and the various pseudoretinoblastomas will be discussed. The technique of the diagnostic examination will be stressed. The aim of the presentation is to facilitate accurate diagnosis of these conditions by the clinician who sees them only infrequently.

COURSE 205

Room 743 Period T-6

VIRGINIA LUBKIN, M.D.
New York

Psychosomatic Aspects of Ophthalmology

Emphasis this year will be upon subjects selected from the large realm covered by the newer psychophysiology. The following topics will be discussed:

1. Recent developments in glaucoma
2. Physiology and clinical utility of hypnosis
3. Experimental advances in the neurophysiology of the psychosomatic process
4. Selected case material demonstrating diagnostic error based upon disregard of the psychogenic in daily practice of ophthalmology

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COURSE 206

Room 724 Period M-4

ANGUS L. MacLEAN, M.D.
Baltimore

Cataracts: Surgical Management

This subject will be considered with respect to preliminary examination, preoperative preparation, the operation, and postoperative care. The general preliminary examination, including necessary specific tests, and the detailed local examination of the eye will be outlined. Preoperative preparation, including both general and local procedures, will be discussed. Significant points in the operative technique will be considered, including the use of the conjunctival flap as opposed to no flap and the choice of techniques for the extraction of the lens in keeping with the age of the patient, the maturity of the cataract and the type of cataract. Postoperative care, from the procedures immediately following the operation to the final refraction and fitting with glasses, will be comprehensively discussed.

There will be a motion picture demonstration.

COURSE 207

Room 727 Period M-6

AUREL E. MANGOLD
New York
BY INVITATION

Proper Fitting of Glasses

This discussion will stress the following subjects:

1. The necessity of analyzing the pre-

scription so that the finished glasses will give maximum comfort and efficiency

2. Anisometropic prescriptions and their effects on reading comfort
3. The importance of individual pupillary distance measurements
4. Lens form and its effect on visual comfort
5. The importance of vertex distance
6. The proper selection of bifocals in cases of hyperopia and myopia
7. Colored lenses
8. Zeiss, Kollmorgen and Feinbloom telescopic and microscopic systems
9. Methods of determining causes of patients' complaints with finished glasses
10. Suggested procedure for examination of a pair of glasses

COURSE 208

Room 712 Period W-4

MORTIMER MANN, M.D.
Indianapolis

Vascular Changes in the Fundus: Clinical Interpretation

The proper interpretation of the changes produced in the fundus as a result of arterial hypertension depends on their correlation with other clinical and laboratory data. The various ophthalmoscopic findings in essential hypertension, malignant hypertension, toxemia of pregnancy, and acute and chronic nephritis will be presented and discussed in relationship to other manifestations of these diseases. The extent to which observations of the fundi are helpful in prognosis and treatment will also be considered.

COURSE 209

Room 721 Period T-4

WILLIAM MANN, M.D.
Chicago

Interpretation of Functional Changes in Vision

Visual disturbances which are not organic in origin are encountered frequently by the ophthalmologist in private practice as well as by the industrial or military ophthalmologist.

It is important that functional visual impairment be differentiated from organic visual impairment. The recognition, basic etiology and treatment of various forms of functional disorders will be discussed. Hysteria and malingering should be differentiated. Though most of these patients are referred to a psychiatrist for treatment, the ophthalmologist should recognize what he can do in treating them.

COURSE 210

Room 713 Period Th-4

PAUL L. MARKS, M.D.
Baton Rouge, La.

Electrical Currents Used in Ophthalmology

An attempt will be made to explain the physical principles underlying the various electrical currents available to the ophthalmologist. An understanding of these principles will enable the surgeon to purchase his equipment more intelligently. What is more important, he will know what to expect following the use of various appliances. Among topics for discussion will be vacuum tube and spark gap circuits, high and low frequency currents, and cutting and coagulating currents. This will be correlated with the equipment that is now available for purchase.

COURSE 211

Room 727 Period W-6

DON MARSHALL, M.D.
Kalamazoo, Mich.

Differential Diagnosis and Treatment of Infections of the Lids

The infections of the lids and their management will be discussed, including differential diagnosis from simulating lesions. Emphasis will be on the clinical and practical aspects of the more common conditions. Primary conjunctivitis and lacrimal diseases will be considered

briefly. Some items covered will be blepharitis, meibomian infections, herpes simplex and zoster, vaccinia, Parinaud's syndrome, and fungus infections. Colored photographs will illustrate part of the lecture.

COURSE 212

Room 781 Period T-6

MALCOLM A. McCANNEL, M.D.
Minneapolis

Efficiency in the Office: Layout and Equipment

Office layout which is practical from the clinician's standpoint, personnel efficiency, and the hard facts of business administration is a problem which must be dealt with by the ophthalmologist beginning in practice.

This course is designed for the ophthalmologist about to open an office. Points under consideration will cover a wide range. Among them will be tips on office planning; practical complete record keeping; communication between the staff and office personnel; a simplified examination procedure form; instruments to aid in the refraction process; the use of color in the office, and other matters important in the organization and management of an efficient office.

There will be time for open discussion of mutual problems. Registrants may wish to submit office plans prior to the meeting, for consideration at the end of the instruction hour.

COURSE 213

Room 732 Period T-6
or or
Room 781 Period W-5

JAMES L. McGRAW, M.D.
Syracuse, N. Y.

Contact Lenses

In this course the relative merits of contact lenses as compared with spectacles will be presented. The advantages and disadvantages of the various types of contact lenses will be reviewed. Among the lenses to be discussed are the conventional fluid lens, the corneal lens, and the ventilated lens.

Comparative fitting time, wearing time, and subjective and objective effects of the various lenses will be discussed. Indications and contraindications for contact lenses will be presented.

COURSE 214

Room 726 Period W-5

WILLIAM P. McGUIRE, M.D.
Winchester, Va.

Cataract: Management of the Patient

This course is offered because it is felt that some discussion of the management of the patient with cataract will be helpful. Discussion of the various surgical procedures will be held to a minimum. The psychological approach to the problem, both in the preoperative and postoperative phases, will be emphasized. Problems in refraction encountered in the rehabilitation of the patient with aphakia will also be considered in some detail.

COURSE 215

Room 712 Period T-6

GEORGE R. MERRIAM, JR., M.D.
New York

Radiotherapy in Ophthalmology

The use of radiation in the treatment of ocular lesions will be discussed with particular emphasis on the late effects. The clinical course of the various diseases will be described briefly and the anticipated benefits of irradiation evaluated in terms of other therapeutic measures and the possible late sequelae. The discussion will be divided into three categories: superficial, low voltage, and high voltage therapy. The factors, dose, treatment time and technique of therapy will be described for each condition.

Superficial therapy will include both grenz ray and beta radiation and will cover treatment of such conditions as vernal catarrh, corneal vascularization, precancerous melanosis, recurrent pterygia, nodular episcleritis, phlyctenular keratitis, bullous and filamentary keratitis, and resistant corneal ulcers.

Low voltage therapy will comprise primarily the treatment of epithelization of

the anterior chamber. A brief discussion will be given of the relative values of irradiation and surgery in the treatment of basal and squamous cell carcinomas of the lid.

High voltage therapy will cover such lesions as retinoblastoma, ocular lymphosarcoma, orbital hemangiomas and metastatic carcinoma to the eye or orbit.

COURSE 216

Room 731 Period T-6

W. HOWARD MORRISON, M.D.
Omaha

Glaucoma: Office Management

The control of glaucoma as an office procedure will be considered. Attention will be directed to the action of medications and their proper prescription. Particular emphasis will be placed upon the use of miotics together with drugs that decrease the production of aqueous.

The importance of the individual's phasic variation pattern in relation to the proper timing of medication will be stressed.

The role and frequency of tonography, tonometry, gonioscopy, ophthalmoscopy, and biomicroscopy, refraction and perimetry will be stressed. A consideration of office records, environmental difficulties and patient education will be undertaken.

COURSE 217

Room 743 Period W-6

WILLIAM F. MURRAH, JR., M.D.
Memphis

Aids for Subnormal Vision: Clinical Evaluation

The author will list and classify the visual aids which he has used in improving the vision, either distance or near, of the patient whose best vision, aided or not aided by glasses, is poor and unsatisfactory.

Kodachrome slides will be used to show these various aids for subnormal vision, including telescopic and microscopic devices; and an evaluation and comparison of their physical characteristics and optical properties will be given along with how they may be used.

The amount of improvement found in the different grades of subnormally poor vision in a comprehensive series of patients following use of the various devices will be shown, and a frank and practical evaluation of these findings is presented.

COURSE 218

Room 712 Period T-4

HOWARD A. NAQUIN, M.D.
Baltimore

Dislocation of the Lens

Displacements of the lens will be reviewed from an etiologic and topographic point of view. The complications arising from displacements of the lens will be outlined and their treatment discussed. Special emphasis will be given to the problem of congenital dislocated lenses and arachnodactyly. Associated systemic and ocular abnormalities of this syndrome will be discussed. The indications for surgical intervention will be presented, and surgical technique will be discussed. Operative and nonoperative complications in a series of cases will be presented.

COURSE 219

Room 712 Period W-6

FRANK W. NEWELL, M.D.
Chicago

Radioactive Isotopes in Ophthalmology

A brief description of the physical properties of radioactive isotopes and the factors involved in selection of an isotope for use in man or experimental animals will be presented. The use of compounds labeled with C^{14} and H^{3} will be discussed, together with the use of isotopes in steady state studies, radioautographs, tumor localization, and ocular metabolism.

COURSE 220

Room 731 Period Th-4

FRANK W. NEWELL, M.D.
Chicago

Refinements in Ophthalmic Surgery

In this course, the chief concern will be with the development of new instruments, with improvements in the production of adequate anesthesia, and with medications and surgical techniques that have proved themselves useful in practice. Various techniques will be illustrated by means of kodachrome slides and motion pictures.

COURSE 221

Room 781 Period W-6

KENNETH N. OGLE, Ph.D.
Rochester, Minn.

Stereopsis: Present Concept

In this course the basic facts of stereoscopic vision will be considered. The topics discussed will include (1) relationship to general space perception, (2) retinal correspondence, (3) disparate images, (4) stereoscopic sensation, (5) stereoscopic acuity, (6) limitations as to both distance and disparity, (7) relationship to fusional movements, and (8) duration of stimuli. Also, some theoretical and practical aspects of stereopsis will be considered. Much of the material for the course will be based on the results of research over the past decade.

COURSE 222

Room 728 Period Th-4

KENNETH N. OGLE, Ph.D.
Rochester, Minn.

Binocular Oculomotor Coordination and Imbalances

The physiologic and neurologic components of the convergence processes, especially as related to the accommodation-convergence association, to fusion and fusional movements, and to the accommodative convergence and the proximal convergence, will be considered. Also discussed will be the phenomenon of fixation disparity and its use as a tool for studying oculomotor imbalances, especially when the eyes are subject to the stress of prism vergences and changes in the stimulus to accommodation. The data of representative cases will be presented.

COURSE 223

Room 784 Period Th-4

JAMES A. OLSON, M.D.
Detroit

Iritis, Iridocyclitis, Keratitis: Differential Diagnosis and Treatment

This course will present a review of the differential diagnostic points in nongranulomatous and granulomatous inflammations of the anterior uveal tract and the nonsuppurative inflammatory lesions of the cornea. Attention will be directed to the current methods of therapy, including the use of corticotropin (ACTH), cortisone, and hydrocortisone. The efficacy of the various methods of administering these agents, the dosages, and the problem of prolonged treatment and repeated treatment will be discussed. The use of antibiotics and the other supportive therapeutic measures in selected cases will be presented. Attention will be directed to the continued importance of careful physical examinations and the subsequent correction of possible causative focal defects of generalized disease processes.

COURSE 224

Room 740 Period T-5

R. TOWNLEY PATON, M.D.
New York

Corneal Transplantation

This course will include information on proper selection of cases, new surgical techniques and instrumentation, postoperative care of patients and the handling of complications. Both penetrating and lamellar keratoplasty will be discussed in detail. The discussion will be illustrated with colored slides and a short motion picture.

COURSE 225

Room 721 Period W-5

HUBERT O. PAULSON, M.D.
Lincoln, Neb.

Lighting for Comfortable and Accurate Seeing

Illumination plays as important a part in correction of asthenopia as do refractions and orthoptics. Many industrial and home visual tasks can be accomplished much more efficiently and comfortably with proper illumination. The five requirements of illumination will be presented according to more recent standards. The proper use of fluorescent and incandescent sources of light will be discussed.

COURSE 226

Room 702 Period M-6

CHARLES A. PERERA, M.D.
New York

Retinal Detachment

Successful surgery in serous detachment of the retina depends upon a knowledge of the pathologic processes involved, the etiologic factors, the preoperative study of the patient, and the technique of operation. In addition to a discussion of these subjects, this course will deal with the prognosis as affected by preoperative and operative findings.

COURSE 227

Room 777 Period M-4

RAYMOND L. PFEIFFER, M.D.
IRA S. JONES, M.D.
New York

Roentgenography of the Eye and Orbit

Perhaps the most common site of lesions of the orbit is the fossa of the lacrimal gland. In addition to the tumors of the gland itself, a variety of other lesions may develop in this region and affect the bone. Since gland tumors may invade bone to produce osteolytic or osteoplastic reaction, or simply lie adjacent to deepen the fossa, differential roentgen diagnosis may be extremely difficult. In this course much material will be presented to illustrate the diverse pathologic changes observed in this part of the orbit.

COURSE 228

Room 726 Period T-5

GUILLERMO PICO, M.D.
Santurce, Puerto Rico

Dacryocystorhinostomy

A technique of external dacryocystorhinostomy which has been found simple, safe and successful will be described in detail. Kodachrome slides and a motion picture in color will illustrate the steps of this operation. The almost complete absence of bleeding is one of its most desirable features.

Important aspects in the regional anatomy will be demonstrated. Preoperative preparation, anesthesia and postoperative care will be discussed.

A short review of the evolution of external dacryocystorhinostomy will be presented.

COURSE 229

Room 702 Period W-5

DOHRMANN K. PISCHEL, M.D.
San Francisco

Problems with Light Therapy

COURSE 230

Room 752 Period Th-4

M. HAYWARD POST, JR., M.D.
St. Louis

Refinements of Refraction: Methods and Measures for Meeting the Problems Encountered

This discussion will be based upon practical experience; therefore, the mathematics of optics will be discussed only as necessary. The basic principles of refraction are presumed to be understood. Nevertheless, a brief outline of the principal methods is in order.

In general, the methods of refraction may be divided into the objective and subjective methods.

Objective Methods

1. Retinoscopy and its complications.
2. The keratometer and its limitations.

Subjective Methods

1. The astigmatic dial.
2. The cross cylinder.

Specific Problems

1. Motor anomalies. Esophoria and exophoria.
2. Vertical imbalance.
3. Aniseikonia. While eikonic lenses will not be considered in this discussion, the primary considerations concerning the proper position of the lenses before the eyes will be emphasized.
4. Aphakia. Specific problems of refraction will be considered, and the type of lenses which should be used. Special consideration will be given to the problems of not only monocular, but bilateral, aphakia. In this connection, contact lenses and the optical problems involved will be discussed.

Random Comments

Certain complications will be met in measuring the eyes of various types of individuals, such as the mentality, inattention during examination, fatigue, the employment of the patient, macular or perimacular lesions, amblyopia, et cetera. The use of the refractor will be discussed. Its advantages and disadvantages will be pointed out.

Ocular Neuroses

These will be considered very briefly, stressing the responsibility of the physician to recognize the difference between the symptoms resulting from actual errors of refraction and those of emotional origin, that often closely resemble them.

COURSE 231

Room 740 Period W-5

ALBERT M. POTTS, M.D.
Chicago

Retinotoxic Substances: The Toxic Amblyopias

With the introduction of new chemical substances into every walk of life, new cases and types of poisoning are occuring. In some instances the effect of these poisons on the eye may be the key to diagnosis, as with poisoning from cholinergic insecticides. In others the danger of permanent damage to the eye or visual system is present and must be dealt with. Prompt diagnosis and treatment often hold the key to preservation of vision and sometimes life, as in methanol poisoning.

Corrosive Substances and War Gases

The discussions will include (1) our new knowledge of the action of toxic substances, (2) rational therapy based on such knowledge, (3) the unique vulnerability of the eye to corrosives and war gases.

Retinotoxic Substances

The validity of old entities such as tobacco-alcohol amblyopia has been questioned. At the same time new substances with retinotoxic properties are causing eye damage, some of them administered inadvertently by physicians. Recent findings will be discussed.

Miscellaneous Chemical Hazards

In the third hour the effects of such unrelated substances as lead, TEPP, chlorodane, beryllium, mescaline, benzoquinone and dithizone will be discussed. Recognition of the effects of each poisonous substance, the incidence of the substance in industry and in private life, and therapeutic measures will be discussed.

COURSE 232

Room 736 Period T-6

ALGERNON B. REESE, M.D.
New York

Cataract Extraction

There will be a general discussion of the subject from various aspects which the author feels need emphasis. These include the cause and control of vitreous pressure; the recognition and handling of deviations from the usual at the time of extraction; the diagnosis, as well as combating untoward occurrences, early and late, in the postoperative course; the cause and treatment of poor postoperative vision; and postoperative glaucoma. Adequate time will be devoted to a discussion of the operation for congenital cataract.

COURSE 233

Room 786 Period M-4

ELLEN F. REGAN, M.D.
New York

Catract Surgery: Complications Due to Defective Wound Healing

Delayed restoration of the anterior chamber, late fistulization, epithelization of the anterior chamber and secondary glaucoma are complications of cataract surgery which may be attributed to faulty healing of the cataract incision. The clinical and pathologic aspects of these conditions will be discussed. Emphasis will be placed upon the prevention and treatment of these conditions.

COURSE 234

Room 711 Period W-5

A. BENEDICT RIZZUTI, M.D.
Brooklyn

Tumors of the Lids and Ocular Adnexa

This course will deal with the more common tumors involving the lids and the ocular adnexa, including the lacrimal gland, lacrimal sac, caruncle and orbit.

Highlights of the diagnostic clinical aspects, pathologic anatomy, and medical and surgical therapy will be emphasized. The salient features will be illustrated by colored lantern slides.

A motion picture entitled "Therapeutic Lamellar Keratoplasty With Use of Preserved Dehydrated Cornea" will be shown.

COURSE 235

Room 711 Period W-6

WILLIAM RUBIN, M.D.
New Brunswick, N. J.

Aims in the Management of Squint

In the management of squint, the chief aim is functional improvement. When this is not possible, a satisfactory cosmetic result can be achieved by surgical intervention. This course will be primarily concerned with functional proficiency. The following topics will be discussed.

A. Elimination of amblyopia
   1. Newer techniques in the detection of slight degrees of eccentric fixation
   2. Detection of anomalous retinal correspondence
      a. Occlusion of good eye
      b. Pleoptics—treatment by patching the squinting eye with subsequent stimulation of the fovea and inhibition of the parafoveal region

B. Creation or restoration of binocular single vision and fusion
   1. Overcoming obstacles to fusion
      a. Classification of obstacles to fusion
   2. Use of miotics and cycloplegics
   3. Use of prisms
   4. Alternate fixation—ideal prerequisite for squint surgery

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COURSE 236

Room 752 T-4

A. D. RUEDEMANN, JR., M.D.
Detroit

The Differential Diagnosis and Surgical Correction of Vertical Muscle Defects

This course will deal with the various vertical muscle problems, their differential diagnosis and surgical correction. The course will describe a selection of muscle problems and their treatment.

COURSE 237

Room 781 Period M-5

WALTER Z. RUNDLES, SR., M.D.
Flint, Mich.

Streak Retinoscopy

COURSE 238

Room 724 Period M-6

RALPH O. RYCHENER, M.D.
Memphis

The Lacrimal Apparatus

This course will present a general review of the lacrimal apparatus, with special emphasis on the treatment of some of the minor but rather troublesome phases encountered in private practice, as well as the more dramatic and quite satisfactory methods of tear sac surgery. The office management of congenital stenosis and the more popular techniques of dacryocystorhinostomy will be fully illustrated with slides.

COURSE 239

Room 702 Period T-6

ALEJANDRO SALLERAS, M.D.
Buenos Aires, Argentina
BY INVITATION

Corneal Surgery

Emphasis will be on practical points of corneal surgery. The author will describe his own technique and the instruments he uses.

The major part of this course will be devoted to a discussion of corneal grafts. Topics under consideration will be the indications for and prognosis of corneal graft; donor material and operative accidents; normal postoperative course and postoperative complications of penetrating and lamellar grafts; results of both types of grafts and retransplants.

Two advanced surgical procedures—plastic corneas, and refractive surgery of the cornea—will be given brief comment.

The indications, complications and results of corneal grafts will be illustrated with photographs of the anterior segment. Colored motion pictures will illustrate the techniques of penetrating and lamellar graft, use of plastic corneas and Barraquer's method of grinding frozen corneas to modify the eye's refraction.

COURSE 240

Room 706 Period T-6

J. ALBERT SARRAIL, M.D.
San Francisco

Plastic Lid Surgery

The course is designed for those who wish to review the fundamentals of lid surgery. The following topics will be covered:

I. Tarsorrhaphy, temporary and permanent

II. Traumatic lesions
   a. Repair of lid borders to prevent lid notching
   b. Repair of canthal ligaments with involvement of canaliculi
   c. Correction of displaced internal and external canthi

III. Entropion—Butler procedure

IV. Ectropion—Paralytic (Kuhnt-Szymanowski operation)

V. Ptosis
   a. Modified Blaskovics procedure with partial acting levator
   b. Modified Reese procedure with complete ptosis

The lecture will be illustrated with a motion picture and slides.

COURSE 241

Room 781 Period M-4
or or
Room 713 Period T-6

HERMAN D. SCARNEY, M.D.
Detroit

Slit Lamp Biomicroscopy
Its Value in Office Diagnosis

The expensive initial investment in a biomicroscope, which has come to be recognized as an indispensable part of the examining equipment of the clinical ophthalmologist, can return many dividends in accuracy of diagnosis and prognosis, and in indications of possible procedure in treatment afforded by no other means.

The value of routine biomicroscopy in office diagnosis will be emphasized by presenting a series of kodachrome slides illustrating fairly common lesions of the lids, conjunctiva, cornea, anterior chamber, iris and lens. Biomicroscopy of the fundus with the Hruby lens will also be discussed.

COURSE 242

Room 732 or Room 752 — Period M-6 or Period W-4

HAROLD G. SCHEIE, M.D.
Philadelphia

Congenital Glaucoma: Surgical Procedures

The surgical treatment of juvenile and infantile glaucoma will be discussed. The development of goniopuncture and the results obtained with this treatment in cases of juvenile glaucoma will be presented. The author's method of goniotomy for infantile glaucoma will be illustrated by slides and a motion picture. An analysis of the results obtained from goniotomy, goniopuncture, and a combination of the two will be made.

COURSE 243

Crystal Room — Period T-5

HAROLD G. SCHEIE, M.D.
Philadelphia

Penetrating Injuries of the Globe

COURSE 244

Crystal Room — Period M-5

ABRAHAM SCHLOSSMAN, M.D.
New York

Pleoptics

Pleoptics is the greatest advance in the treatment of amblyopia in recent years, and it is especially valuable in the treatment of patients with eccentric fixation. A short discussion of new concepts of the nature and pathogenesis of amblyopia will lead up to the subject of pleoptics. Theoretic principles of this form of therapy will be briefly discussed, but most of the session will be devoted to the practical details of pleoptics. The methods of Bangerter and Cuppers will be compared. Diagnosis of eccentric fixation with the Visuscope will be demonstrated, and the use of the Euthyscope and Coordinator will be considered in detail. The value of other instruments, such as the Pleoptophor, Localizer, Corrector, and Mnemoscope Trainer, will be briefly pointed out. The concept of a defect of separation acuity and its treatment will also be presented.

COURSE 245

Room 786 — Period M-5

DR. THEO SCHMIDT
Bern, Switzerland
BY INVITATION

Applanation Tonometry

The Goldmann applanation tonometer, an attachment to the slit lamp, will be described. Tonometry by means of this attachment will be discussed. Its advantages and disadvantages will be compared with impression tonometry, particularly to tonometry done with the Schiotz tonometer. The examiner must follow instructions closely to obtain useful results. This course aims at transmission of knowledge of examination techniques. Sources of faults and how they may be avoided will be considered.

COURSE 246

Room 734 — Period T-6

JAMES S. SHIPMAN, M.D.
Camden, N. J.

Scleral Resection

1. The indications for this operation as a primary procedure:
   a. Failure of the detached retina to settle back in place with bed rest
   b. High myopia
   c. Aphakia
   d. Retinal folds or vitreous bands
   e. Failure of less formidable methods
2. Preoperative study and preparation of the patient
3. Operative procedure:
   a. Partial or lamellar type of resection less hazardous and preferable
   b. Anatomic landmarks on sclera, such as position of vortex veins, macula, recti, and oblique muscles
   c. Position, size and shape of the area of sclera to be resected

d. The operative technique will be illustrated with slides, showing each step from beginning to end and a new technique of folding in portion of sclera

4. Postoperative treatment and management, complications, and results

A new procedure, an enfolding of the sclera, as done by the author is described and illustrated with slides and a motion picture.

COURSE 247

Room 793 Period W-6

JOHN T. SIMONTON, M,.D.
Rye, N. Y.

Orbital Surgery

The surgical anatomy of the orbit will be reviewed.

The value of careful preoperative work-up will be emphasized, stressing the importance of teamwork between the ophthalmologist and the radiologist, otolaryngologist, neurosurgeon, internist and pathologist.

The rationale for exploration of the orbit in the presence of unexplained progressive proptosis will be mentioned.

Various surgical approaches to the orbit will be discussed and demonstrated by means of kodachrome slides and motion pictures.

COURSE 248

Room 744 Period M-5

G. VICTOR SIMPSON, M.D.
Washington, D. C.

Hemorrhage into the Vitreous: Diagnosis and Management

Hemorrhage into the vitreous is frequently the initial sign of a serious eye disease. It is with the diagnosis and management of vitreous hemorrhage in such circumstances that this course is concerned.

Massive hemorrhage into the vitreous is readily recognized, but the blurring of vision from a mild hemorrhage must be distinguished from (1) rupture of a peripheral retinal cyst, (2) separation of a rosette from the peripheral retina, (3) rupture of the posterior hyaloid from its attachment at the optic nerve, and (4) subacute uveitis. The points of differentiation from the above will be discussed.

Hemorrhage into the vitreous may be caused by a number of ocular and systemic conditions. An outline of these conditions will be given.

Treatment to aid absorption of blood from the vitreous, and specific treatment, when available, to prevent recurrences will be discussed during the hour.

COURSE 249

Room 721 Period T-5

BYRON SMITH, M.D.
New York

Fractures of the Orbit

Ophthalmologists rather than other specialists should manage orbital fractures. This course will deal with the causes, mechanisms, symptoms, signs, complications, and treatment of early and late fractures.

Roentgenography of fractures of the orbit will be discussed as well as the role of electromyography and the treatment of enophthalmos. Illustrations by slides and motion pictures will emphasize some of the salient manifestations in the diagnosis and treatment of orbital fractures.

COURSE 250

Room 740 Period T-4

J. LAWTON SMITH, M.D.
Durham, N. C.

Neuro-ophthalmology

I. Ophthalmodynamometry and Cerebrovascular Disease
   1. Premonitory symptoms of cerebrovascular insufficiency
   2. Amaurosis fugax
   3. Techniques of ophthalmodynamometry

4. Indications for ophthalmodynamometry
5. Ocular bruits
6. Therapy

II. Optokinetic Nystagmus
1. Techniques
2. Uses
3. Clinical interpretation

III. Topical Diagnosis of Third Nerve Palsies
The localizing value of the eight anatomical syndromes of the third nerve will be discussed.

IV. Ocular Manifestations of the Pierre Robin Syndrome

Severe ocular disease may be encountered in the Pierre Robin syndrome (microagnathia, cleft palate, and glossoptosis). The ocular defects found in 30 cases with microagnathia will be reviewed.

COURSE 251

Room 713 Period W-4

EDMUND B. SPAETH, M.D.
Philadelphia

Plastic Surgery: Practical Aspects

There are many basic procedures and techniques in ophthalmic plastic surgery. This course is aimed especially toward correction of defects due to malignant lesions. These are threefold: (1) removal of the malignant lesion; (2) correction of the defect caused by the lesion; and (3) cure of the basic condition.

COURSE 252

Room 702 Period T-4

EDMUND B. SPAETH, M.D.
Philadelphia

Complicated Ptosis: Selection of Operation

It is well known that over fifty per cent of the cases of congenital ptosis are complicated by factors other than drooping of the lid. Acquired ptosis has an even greater incidence of such complications. Most all of these complications are correctible by surgical techniques.

This course is concerned with three factors related to ptosis complications: (1) the ptosis itself, (2) the correction of the complication, and (3) the sequence of surgical procedure.

COURSE 253

Room 740 Period M-5

PHILIP G. SPAETH, M.D.
Philadelphia

PAUL L. CARMICHAEL, M.D.
Lansdale, Pa.

Ocular Tumors: Differential Diagnosis and Treatment

A classification of tumors of the globe will be given.

There will be emphasis on the multiple facets of diagnosis including ophthalmoscopy, binocular ophthalmoscopy, biomicroscopy, transillumination, campimetry, x-ray, and radioactive isotopes.

The practical application of radioactive isotopes in the diagnosis of intraocular and extraocular lesions will be discussed with relationship to type of lesions, age of patient, and interpretation of the tests.

A discussion of therapy, including radiotherapy, chemotherapy, diathermy, surgery, and expectant treatment will be included.

COURSE 254

Room 724 Period T-6

FREDERICK P. SUTLIFF, M.D.
Philadelphia

Practical Fitting of Corneal Lenses

The method for the fitting and prescribing of corneal contact lenses will be presented. The indications and contraindications, including patient selection, will be discussed. The method of refraction, measurement of the cornea, and ophthalmometry will be outlined. The writing of prescriptions from this information will be demonstrated. Instructions to patients on insertion and

removal of corneal lenses and wearing-time schedules will be presented. The management of the patient's problems and follow-up visits will be discussed.

COURSE 255

Room 784 Period W-6

EDWIN C. TAIT, M.D.
Norristown, Pa.

Heterophoric Asthenopia: Evaluation and Treatment

This discussion is designed to illustrate the limitations of the Duane-White classification when considering therapy for neuromuscular anomalies. An alternate classification, which simplifies the interpretation of the possible findings and allows a more rational approach to the selection of therapy, will be presented.

COURSE 256

Room 750 Period W-6

I. S. TASSMAN, M.D.
Philadelphia

Eye Involvement in Systemic Diseases

Many of the systemic diseases may either cause or be accompanied by an eye disorder. Such diseases may be classified as congenital, hereditary, heredofamilial and acquired. In a number of instances the eye condition may be quite severe and should be cared for by an ophthalmologist.

Those conditions which are of greatest importance to the ophthalmologist will be presented and discussed.

COURSE 257

Room 734 Period M-6

FREDERICK H. THEODORE, M.D.
New York

Ocular Therapeutics

An appreciation of the potentialities and the limitations of the agents at our disposal is a prerequisite for effective therapy. Many new and potent drugs are now widely used in ocular therapeutics. Valuable as they are, their introduction has posed therapeutic problems other than the dangers from injudicious use.

A practical clinical approach will be made to the treatment of external diseases of the eye, with a critical evaluation of those drugs, both old and new, currently used for this purpose. The action of the drugs, indications and specific contraindications for their use, the capricious behavior and unreliability of some of them, and methods for their application will be considered in detail. The importance of vehicles in general, the choice of appropriate ones, and specific problems and dangers inherent in the prescribing of ophthalmic drugs will be stressed. The necessity for differentiating drug reactions due to allergy from drug reactions due to irritations will be discussed from the therapeutic point of view. General principles concerning the treatment of ocular eczemas will be outlined. The entire lecture will be illustrated by kodachrome slides of clinical cases.

COURSE 258

Room 795 Period W-6

ROBERT I. TRENT, M.D.
Oklahoma City

Progress in Ophthalmology: Therapy, Including Psychotherapy

The following topics will be discussed:

1. Angiospastic retinopathy and macular edema: etiology; treatment
2. Corneal epithelial erosion: etiology; special form of determination
3. Ocular migraine: etiology; treatment
4. Blepharospasm in children: a successful treatment
5. Ocular degeneration: management including treatment of senile macular form
6. Incipient cataract and/or glaucoma: exceptional treatment
7. Care by assistants or associates supplementary to surgical operation
8. Approach of the ophthalmologist to

the first visit of the very young child

9. Reading difficulties: their treatment in children of all ages

10. Preparing children and adults for wearing various types of glasses, including contact lenses

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COURSE 259

Room 744 Period T-6

STANLEY M. TRUHLSEN, M.D.
Omaha

Home Orthoptics

The ophthalmologist who does not have an orthoptic technician can make use of many simple and practical devices to stimulate and improve the fusional process.

This course will present orthoptic devices and methods that can be used by patients in their homes and on their own time.

The uses, advantages and disadvantages of some of the commercially available instruments, such as the Ortho-Fusor, T. V. Trainer, and stereoscope, will be discussed. Emphasis will be given to the simpler, inexpensive tools developed and used by orthoptic technicians.

COURSE 260

Room 716 Period T-5
or or
Room 724 Period W-6

ALFRED UIHLEIN, M.D.
Rochester, Minn.
BY INVITATION

Neuralgias of the Head: Treatment

Most of the pain about the head and face can be outlined along definite nerve pathways. The most logical treatment is to eradicate the cause, but all too frequently this is impossible. Neuralgia should be distinguished from neuritis. The former is a sharp, intermittent pain along the distribution of a given nerve. Neuritis, on the other hand, produces pain that is continuous and lancinating and frequently is accompanied by tenderness, paresthesia or anesthesia; motor paralysis is present if a mixed nerve is involved. For simplicity in diagnosis and treatment, the neuralgias of the head can be divided into minor and major types. The diagnosis and treatment of facial pain in relation to the major and minor neuralgias will be reviewed and illustrated by slides.

COURSE 261

Room 738 Period W-6

DERRICK VAIL, M.D.
Chicago

Senile Cataract:
Mechanical Factors of Surgery

A short description of the origin and insertion of the zonular membrane will be given. This is the keystone in the problem of cataract extraction. Mechanical factors involved in the operation, with and without alpha-chymotrypsin will be stressed. Necessary modifications of the standard operation when zonulolysis is utilized will be described, and the problems it creates will be discussed.

COURSE 262

Room 740 Period M-4

EVERETT R. VEIRS, M.D.
Temple, Texas

External Dacryocystorhinostomy
and
Corrective Procedures for Epiphora

The diagnosis and treatment of lacrimal disorders will be presented.

External dacryocystorhinostomy will be described in detail and illustrated by a motion picture and lecture slides.

The causes and correction of epiphora in the various age groups will be discussed. Corrective procedures will be illustrated, particularly stressing epiphora in the aged.

COURSE 263

Room 740 Period W-4

SAMSON WEINGEIST, M.D.
Long Island City, N. Y.

Lacrimal Sac Surgery

Surgical operations on the lacrimal sac, particularly dacryocystorhinostomy ab externo, will be discussed step by step, stressing correct anesthesia, local or general, proper illumination of the operative field, simple instrumentation and hemostasis. An easy way to procure a large bony window (dealing with ethmoid cells, if encountered) in order to secure permanent drainage will be outlined. The simple placement of posterior and anterior sutures to anastomose the nasal mucosa with the lacrimal sac will be shown.

Surgery in adults and small children will be compared.

Indications, contraindications and complications will be discussed.

Emphasis will be placed on the simplification of the difficulties that many general ophthalmologists encounter.

Slides and a film in color will be shown.

COURSE 264

Room 781 Period M-6

C. WILLIAM WEISSER, M.D.
Pittsburgh

Repair of Corneal Injuries

Corneal abrasions, burns, lacerations and similar lesions will be discussed in the light of newer methods of therapy, including antibiotics, fibrin film, and steroid irradiation.

A series of cases in which prolapsed iris was replaced will be discussed, and color photographs will be shown comparing those with lens damage to those without damage.

Instruments, sutures and techniques will be discussed.

COURSE 265

Room 713 Period M-6

JOHN P. WENDLAND, M.D.
Minneapolis

Magnetic Intraocular Foreign Bodies

Magnetic intraocular foreign bodies will be discussed under the following headings: (1) diagnosis, (2) localization, (3) preoperative treatment, (4) surgical approach, (5) complications, and (6) postoperative treatment. Particular stress will be placed upon the use of the Berman locator and its new curved probe in the localization of these intraocular foreign bodies during surgical procedures, and upon the techniques for removal of these foreign bodies in different locations in the globe.

Slides and a motion picture will illustrate the discussion.

COURSE 266

Room 726 Period T-4

EVERET H. WOOD, M.D.
Albuquerque, N. M.

Macular Lesions:
Early Diagnosis and Treatment

The lecture will consist of a brief review of the embryology, anatomy and physiology of the macular region, followed by a discussion of some of the more common and disturbing lesions in this area. Particular emphasis will be placed on the handling of these lesions in the aging patient. The course will be illustrated by kodachrome and black-and-white slides.

COURSE 267

Room 706 Period T-4

CHARLES A. YOUNG, JR., M.D.
Roanoke, Va.

JOSEPH M. DIXON, M.D.
Birmingham, Ala.

Contact Lenses

Included in this course will be a discussion of the criteria for the selection of patients. Instruments and materials needed, step-by-step procedure, advice to the patient, complications encountered, and results achieved are all considered. The discussion, illustrated with colored slides, is limited to the smaller corneal-type lenses.

CONTINUOUS COURSES — OTOLARYNGOLOGY

1960

COURSE 301

Room 716 Periods T-1, T-2

JACK R. ANDERSON, M.D.
New Orleans

Rhinoplasty: Practical Considerations

A two-period course—$4.00

The purpose of this course is to present certain features of technique—some original, some adapted from others—which have facilitated the performance of rhinoplasty and have contributed to improved and more predictable results. In addition, details of preoperative preparation and postoperative care which have effected a marked decrease in morbidity following the operation will be discussed.

COURSE 302

Room 728 Periods Th-1, Th-2

SHIRLEY HAROLD BARON, M.D.
San Francisco

Tympanoplastic Procedures: Evaluation of the Advantages and Pitfalls

A two-period course—$4.00

A basic concept of tympanoplasty with Wullstein's classification will be reviewed, and Professor Wullstein's motion picture illustrating each procedure will be shown. This will be followed by a discussion of experiences with these techniques and an attempt to relate their advantages and pitfalls. Certain variations, including the use of prostheses, will be presented.

COURSE 303

Room 726 Periods Th-1, Th-2

DAVID W. BREWER, M.D.
and
F. BERTRAM BRIESS
BY INVITATION
Syracuse, N. Y.

Head and Neck Symptoms Associated With Laryngeal Microtrauma: Diagnosis and Management

A two-period course—$4.00

Many otolaryngologists are required daily to evaluate such symptoms as pain in the neck, neck pain referred to the ear, dry throat, frequent throat clearing, lump in the throat, cough, and postnasal discharge. The association of these symptoms with intermittent or persistent voice changes is often not made by the patient.

New techniques of laryngeal examination, both operative and functional, now uncover more easily the causes of an underlying dysphonia. Audible and/or visible lesions due to repeated laryngeal microtrauma caused by many identifiable intrinsic laryngeal muscle imbalances are discussed.

Office management, methods for exclusion of carcinoma in the differential diagnosis, and proper testing techniques leading to an accurate diagnosis are described. A unique regimen of voice therapy based on such a diagnosis and supported by recently reported electromyographic findings as well as disappearance of lesions and relief of symptoms is presented.

COURSE 304

Room 734 Periods T-1, T-2

COURSE 305

Room 734 Periods W-1, W-2

JOHN J. CONLEY, M.D.
and
MAURICE LENZ, M.D.
BY INVITATION
New York

Carcinoma of Head and Neck: Diagnosis and Treatment

A two-period course—$4.00

This two-hour course is being presented twice, as Course 304 on Tuesday and

as Course 305 on Wednesday. **Please select course number according to day on which you wish to attend.**

The course includes an analysis of cancers involving all the major systems of the head and neck area: the various types of malignant tumors involving the epithelium, sinuses, ears, lips, tongue, buccal mucosa, palate, nasopharynx, floor of the mouth, hypopharynx, parotid gland, cervical lymphatics, thyroid gland and cervical esophagus (larynx intentionally omitted because of its inclusion in other courses).

A discussion of the diagnosis of these malignant tumors will be based on the pertinent factors in the history, physical examination, roentgenograms, chemical tests, and various biopsy techniques relative to each case.

Emphasis will be placed on the use of supervoltage in the treatment of malignant tumors of the head and neck.

A discussion of treatment will include the curative effects of various types of surgery and irradiation and combinations of these two techniques. It will also include the worthwhile palliative efforts in the management of incurable cancer by surgery, irradiation or combinations of these techniques.

COURSE 306

Room 731 Periods T-2, T-3

JOHN MARQUIS CONVERSE, M.D.
New York

Principles of Nasal Plastic Surgery—Basic

A two-period course—$4.00

The main steps in the typical corrective nasal plastic operation will be reviewed. The course will be illustrated by slides and motion pictures.

COURSE 307

Room 731 Periods Th-2, Th-3

JOHN MARQUIS CONVERSE, M.D.
New York

Principles of Nasal Plastic Surgery—Advanced

A two-period course—$4.00

This course is more advanced than the preceding one and deals with conditions such as nasal deviations and saddle nose, in addition to the main steps in the typical corrective nasal plastic operation.

COURSE 308

Room 726 Periods T-2, T-3

MEYER S. FOX, M.D.
Milwaukee

ARAM GLORIG, M.D.
Los Angeles

Noise in Industry: Progress and Recent Developments

A two-period course—$4.00

Topics for Discussion

1. The physical aspects of noise, its measurement, and its effect upon man
2. The medical aspects of hearing loss due to noise exposure
3. The determination of hearing loss and hearing disability resulting from noise exposure
4. The medical-legal aspects of noise deafness
5. Hearing conservation programs in industry

This course has been planned for otolaryngologists who are actively engaged in hearing conservation programs in industry and for any others who are interested in the industrial noise problem. The presentation will consist of an informal panel discussion by members of the Subcommittee on Noise who have been very active in the field of industrial noise. Emphasis will be placed upon practical measures and a realistic approach to the problem. The presentation will be supplemented by charts, slides and tape recordings taken from actual industrial situations.

Those planning to attend this course who have questions regarding particular problems which they wish to have discussed should submit them by mail or in person before the conference begins.

A question period will be provided, and an opportunity will also be afforded anyone in attendance who may wish to relate his experiences in meeting various problems in the field of industrial noise.

COURSE 309

Room 712 Periods T-2, T-3

Z. Z. GODLOWSKI, M.D.
Chicago
BY INVITATION

I. Physiopathology of the Endocrine System

II. Enzymatic Mechanism of Allergy

A two-period course—$4.00

I

1. Relationship of hypothalamus to autonomic nervous system, endocrine glands and target cells
2. Primary and secondary endocrine disorder: therapeutic and diagnostic importance
3. Strategic position of anterior pituitary lobe and thyroid gland in clinical symptomatology
4. Questions and answers

II

1. Enzymes, their action and their relationship to hormones
2. Enzymatic diseases: enzymatic mechanism of allergy
3. Self-termination of allergic reactions, desensitization by low-dosage method of antigen as seen in enzymatic mechanism of allergy
4. Practical conclusions in antiallergic therapy in office practice based on enzymatic mechanism of allergy
5. Questions and answers.

COURSE 310

Room 712 Periods Th-2, Th-3

Z. Z. GODLOWSKI, M.D.
Chicago
BY INVITATION

Endocrinopathies: Management of Subclinical and Clinical Forms in Office Practice

A two-period course—$4.00

Diagnosis

1. Diagnostic evaluation by physical examination
2. Choice of laboratory tests and their interpretations
3. Questions and answers

Therapy

1. Advantages and disadvantages of "single" and "multiple" therapeutic agents
2. Etiologic therapy in hormonal disorders
3. Substitution therapy in hormonal disorders
4. Antiphlogistic value of adrenocortical steroids
5. Adjustment of emotional disorders in hormonal disorders related to allergic reactions
6. Questions and answers

COURSE 311

Room 712 Periods W-1, W-2

FREDERICK R. GUILFORD, M.D.
WILLIAM K. WRIGHT, M.D.
Houston, Texas

Techniques of Tympanoplasty

A two-period course—$4.00

It is our purpose to discuss the various techniques of tympanoplasty. The discussion will include criteria for the selection of candidates, preoperative care, application of the various techniques during surgery, postoperative care, and operative and postoperative problems encountered.

Physiology of the middle ear conduction mechanism as applied to the various types of tympanoplasty will be reviewed. Our results with the various types of tympanoplasty will be discussed.

Slides and a motion picture will be used as instruction aids.

COURSE 312

Room 710 Periods T-2, T-3

FRENCH K. HANSEL, M.D.
St. Louis

Allergy and Medical Otolaryngology

A two-period course—$4.00

The problems of medical otolaryngology are varied, multiple and ever changing. In many instances the indications for surgical interference must be evaluated only after medical treatment and observation. The management of the patient, therefore, is directed to the consideration of disease and loss of function which affect the ears, nose and throat, and related structures. These problems concern allergy, infection, immunity, anemia, malnutrition, dental caries, effects of tobacco and alcohol, endocrine deficiencies, loss of function as manifested by vascular headaches, vertigo and tinnitus, deafness, psychosomatic disturbances and other related conditions.

COURSE 313

Room 711 Periods T-1, T-2

FREDERICK HARBERT, M.D.
Philadelphia

Clinical Audiology

A two-period course—$4.00

Usual and special audiologic tests will be considered from the standpoint of the clinician. Audiologic findings will be related to underlying pathologic conditions and diagnosis in the first hour of didactic presentation. The second hour will be spent in illustrating the application of these principles with case presentations on slides. Emphasis will be placed on speech audiometry, bone conduction, masking and recruitment from the standpoint of interpretation, and avoidance of errors. The indications for special audiometric tests will be considered.

COURSE 314

Room 713 Periods W-2, W-3

WILLIAM G. HARDY, Ph.D.
MIRIAM D. PAULS, Ph.D.
Baltimore
BY INVITATION

Clinical Audiology for Children

A two-period course—$4.00

With infants and preschool children, particularly those with delayed speech, special techniques must be used to evaluate the hearing function and its relation to the child's development and behavior. Several techniques (employing calibrated toys and noise-makers, tuning forks, pure tone and speech audiometry, masking, and the like) will be considered in detail. These range from what is useful in ordinary office practice to procedures involving special facilities.

Particular attention will be given to current "objective" procedures whereby a child is conditioned to respond to test sounds. Some details of management will be discussed, and there will be consideration of the relation between various causal factors and test findings and the development of language and speech in the child.

COURSE 315

Crystal Room Periods W-1, W-2

HOWARD P. HOUSE, M.D.
WILLIAM F. HOUSE, M.D.
Los Angeles

Reconstructive Surgery for Chronic Ear Disease

A two-period course—$4.00

Tympanoplastic procedures have undergone tremendous changes since their introduction in the early 1950's. The dual aims of tympanoplasty are the eradication of infection and the reconstruction of the hearing mechanism of the middle ear.

The surgical philosophy of creating a safe ear by opening the ear spaces for drainage has been gradually replaced by a surgical approach designed to eradicate infection completely and to promote primary healing. The ultimate goal of tympanoplasty is the complete eradication of infection and the reconstruction of the sound conducting mechanism of the ear without leaving the surgical defect of a postoperative mastoid bowl.

Many problems in the attainment of this goal have been overcome. Every otolaryngologist should know the indications for newer medical and surgical therapy of the chronic ear patient.

COURSE 316

Room 711 Periods W-1, W-2

KENNETH C. JOHNSTON, M.D.
IRWIN D. HORWITZ, M.D.
BURTON J. SOBOROFF, M.D.
Chicago

Emergencies in Otolaryngology

A two-period course—$4.00

A panel discussion will cover the common emergencies encountered in otolaryngologic practice under three principal headings: injuries of the head and face, including intracranial complications; control of hemorrhage and simple methods of estimating blood loss to permit adequate restoration of blood volume; and, finally, the recognition and management of acute respiratory obstruction, considering anomalies, acute infections and injuries of the larynx and tracheobronchial tree and a brief review of sudden and severe obstruction due to foreign bodies in the air passages.

Kodachrome slides will be used for demonstration. Time will be allotted for general discussion and pertinent questions at the end of the panel presentation.

COURSE 317

Room 731 Periods W-2, W-3

VARAZTAD H. KAZANJIAN, M.D.
Boston
JOHN MARQUIS CONVERSE, M.D.
New York
EDGAR M. HOLMES, M.D.
Boston

Traumatic Injuries of the Face

A two-period course—$4.00

The symposium on early treatment of facial injuries, to be held during the first period, will cover (1) emergency measures consisting of the control of primary hemorrhage, traumatic shock, and other necessary first aid measures; (2) local examination of lacerations and fractures of the face plus general physical examination; and (3) early treatment of soft tissues, primary and late primary suturing of lacerations, and the immobilization of fractures with special reference to fractures of the nasal, zygomatic and maxillary bones.

The second period will be utilized for a symposium on treatment of deformities of the face of traumatic origin, including discussion of (1) some general principles of reconstructive surgery of the face, and (2) repair of deformities involving soft tissues only, including (a) conspicuous scars without apparent loss of tissue, (b) defects with definite loss of tissue requiring use of pedicle or skin grafts, (c) special areas such as the eyelids and eyebrows, and (d) stenosis of the nasal passages.

COURSE 318

Room 716 Periods Th-2, Th-3

FRANK D. LATHROP, M.D.
MOSES H. LURIE, M.D.
BERNARD ZONDERMAN, M.D.
Boston

Your Otologic Problems

A two-period course—$4.00

This course is presented as an informal discussion of problems of any nature in the field of otology. Since dizziness, deafness, and secretory otitis media often pose problems of management, the first part of the allotted time will be spent in brief statements by various members of the panel concerning these subjects. The remainder of the time will be occupied by questions and answers and a general discussion of otologic treatment. It is hoped that all who register for this course will participate in the questions and answers and general discussion. Furthermore, it is hoped that no one will fail to ask a question because it is thought that the problem is too insignificant. All problems assume great magnitude when the answer is not known.

COURSE 319

Room 726 Periods W-2, W-3

MERLE LAWRENCE, Ph.D.
Ann Arbor, Mich.

Acoustic Principles in Middle Ear Surgery

A two-period course—$4.00

This course is an elementary explanation of the acoustico-mechanical properties of the middle ear apparatus. Those anatomic characteristics of the ear that provide for efficient transfer of air-borne sound vibrations to the fluids of the inner ear will be discussed. The various ways in which structural alteration or disease processes can affect these middle ear properties, together with the basic principles that must be adhered to in restoring adequate sound conduction, will be described.

The material covered will be divided into two parts. In part one, the normal actions of the middle ear as a mechanical transformer will be described, and the reasons for certain patterns of audiometric loss due to various pathologic conditions will be explained.

In part two, principles of middle ear reconstruction that can satisfactorily reestablish the mechanical principles that make the normal ear an efficient device will be evaluated, and the effects of different procedures on the resulting audiogram will be discussed.

COURSE 320

Room 715 Periods T-2, T-3

COURSE 321

Room 715 Periods W-2, W-3

JOHN R. LINDSAY, M.D.
Chicago

Deafness and Dizziness of Vascular Origin

A two-period course—$4.00

This two-hour course is being presented twice, as Course 320 on Tuesday and as Course 321 on Wednesday. **Please select course number according to day on which you wish to attend.**

Vascular lesions may affect the auditory and vestibular mechanisms either together or separately and in varying degrees. A lack of factual information as to the nature and location of these lesions has made the diagnosis and interpretation inadequate. A number of experiments on animals have been done in our laboratory which illustrate the possible effect of certain vascular lesions on function. A series of cases also has been selected to illustrate the various clinical types. The discussion will consist of a presentation of clinical types along with the evidence which has been obtained by experimentation.

COURSE 322

Room 722 Periods Th-2, Th-3

KINSEY M. SIMONTON, M.D.
Rochester, Minn.

SCOTT N. REGER, Ph.D
Iowa City
and
ALAN S. FELDMAN, Ph.D.
Syracuse, N. Y.
BY INVITATION

ROBERT E. KLOTZ, M.D.
Boston

What the Otologist Should Know About Hearing Aids

A two-period course—$4.00

This will be an informal question-and-answer symposium on hearing-aid problems as they arise in daily otologic practice. The participants are invited to submit such questions as the following:

When does a hard-of-hearing patient need a hearing aid?

What are the comparative merits of bone and air conduction instruments?

What are the limitations of a hearing aid?

Which is the best hearing aid?

How should the patient go about getting a hearing aid?

What can the otologist do to combat high-pressure salesmanship?

COURSE 323

Room 722 Periods T-2, T-3

GEORGE A. SISSON, M.D.
NORMAN E. JOHNSON, M.D.
and
FRANK BATLEY, M.D.
BY INVITATION
JACK J. ROSE, D.D.S.
BY INVITATION
Syracuse, N. Y.

Team Judgment in the Management of Head and Neck Cancer

A two-period course—$4.00

A successful head and neck cancer team should be composed of an alert diagnostician, a competent surgeon, a widely trained radiotherapist and a qualified prosthodontist. The format for preoperative conferences with all members of the team participating will be described as it operates now at the State University of New York Upstate Medical Center.

Difficulties encountered when determining primary or secondary modality of treatment used will be presented by both surgeon and radiotherapist. All principal areas of the head and neck will be included in the discussion.

A prosthodontist will explain how he can give support most effectively both in the operating room and postoperatively. A model case will be presented to illustrate how the services of a cancer control team are integrated.

COURSE 324

Room 711 Periods Th-1, Th-2

THEODORE E. WALSH, M.D.
St. Louis

What Can Be Done For Deafness

A two-period course—$4.00

The problems of relieving deafness, including the efficacy or failure of various forms of treatment and surgery, will be considered. The value of hearing aids and rehabilitation measures for patients who cannot be helped by medical or surgical means will be discussed. The apparent success of quackery will be explained. The members of the course are encouraged to submit questions and to join actively in an informal discussion of the subject.

INDIVIDUAL COURSES — OTOLARYNGOLOGY

COURSE 401

Room 740 Period T-1

LUCIAN W. ALEXANDER, M.D.
New Orleans

The Adenoid Problem

There is no operation in surgery so badly done in such a large percentage of cases as the adenoid operation. A discussion of the pathology, techniques, failure in results, postoperative treatment to avoid middle ear infection, the management of adenoid remnants and case histories will be presented.

Kodachrome slides will be used.

COURSE 402

Room 716 Period W-1 or Th-1

VICTOR R. ALFARO, M.D.
Washington, D. C.

Fullness in the Ear: Differential Diagnosis

Fullness in the ear, a symptom commonly seen in otologic practice, is usually thought to indicate disorders of the conductive mechanism in the external canal, middle ear, or eustachian tube. Careful appraisal of patients with fullness in the ear, however, reveals that it is a very common symptom of early labyrinthine hydrops. In advanced labyrinthine hy-

drops the diagnosis is self-evident because of the involvement of the vestibular apparatus as well as the cochlea. Early recognition, therefore, is most important for the establishment of early therapy that will prevent the mild hydrops from becoming severe. The symptomatology, audiometric picture, differential diagnosis and treatment will be discussed.

COURSE 403

Room 724 Period T-3

FRANZ ALTMANN, M.D.
JULES G. WALTNER, M.D.
New York

Treatment of Meniere's Disease with Ultrasonic Waves

The basic principles and the technique of irradiation of the labyrinth with ultrasound will be discussed.

With a specially constructed applicator the ultrasound is given directly to the exposed bony lateral semicircular canal. This permits destruction of the vestibular portion of the labyrinth without damage to the cochlea.

The results of this treatment in patients with Meniere's disease which had been refractory to medical treatment will be analyzed. They are very satisfactory, since the preservation of hearing is far superior to that obtained with any other form of surgical treatment.

COURSE 404

Room 706 Period T-3 or W-3

BARRY J. ANSON, Ph.D.
ROBERT LAUGHLIN REA
Chicago
BY INVITATION

Stapediovestibular Anatomy in Relation to the Problems of Stapes Surgery

The major hazards in currently favored procedures in endaural surgery are set by the following features of developmental and adult anatomy of the stapes and related structures: retention, by the stapes, of its embryonic cartilage and fetal bone (with consequent excessive fragility in adult structure and probable inability to heal); nearness of the stapedial base to vital parts of the endolymphatic duct system; invasion of the surgeon's "working space" of the middle ear by the promontory of the cochlea and the arch of the facial canal; thinness of the wall of the cochlea and dehiscence of the canal of the facial nerve.

The lecture will be illustrated by lantern slides prepared from photomicrographs of sections and drawings of reconstructions and dissected specimens of original otologic material.

COURSE 405

Room 710 Period W-1

BEVERLY W. ARMSTRONG, M.D.
Charlotte, N. C.

Use of Vinyl Tubing in the Treatment of Chronic Secretory Otitis Media

In the past fifteen years we have observed an increase in the incidence of chronic secretory otitis media. It is the most common cause of impaired hearing in children. Experience in ventilating the middle ear with indwelling plastic tubing will be presented and the results analyzed. The lecture will be illustrated with a motion picture and lantern slides.

COURSE 406

Room 727 Period W-3

RALPH A. ARNOLD, M.D.
Durham, N. C.

Radiographic Diagnosis of Temporal Bone Lesions

Normal anatomy of the temporal bone as seen on a roentgenogram will be demonstrated and discussed. The usual views that are taken will be described, as well as what information can be obtained therefrom.

Pathologic changes that can be demonstrated roentgenographically will be shown of cases that have been proved by surgery or by biopsy.

Pitfalls and errors in diagnosis will be discussed; however, the techniques of taking roentgenograms will not be discussed.

COURSE 407

Room 706 Period Th-1

JOSEPH P. ATKINS, M.D.
Philadelphia

Bronchoscopic Problems of Infancy and Childhood

The true test of an endoscopist's skill is the way he handles the endoscopic problems of the child. The difficulties which may be encountered and the techniques most useful in eliminating them will be discussed. Radiologic evaluation of bronchoscopic problems and endoscopic techniques most useful in the solution of these problems will be considered.

COURSE 408

Room 715 Period Th-2

OSCAR J. BECKER, M.D.
Chicago

Plastic Surgery of Protruding Ears

An original technique for correcting protruding ears is to be presented. This method has proved highly satisfactory in reproducing the normal contours of the auricle and in setting the ear back to the head at the proper angle.

The anatomy of the external ear, the etiology and pathology of protruding ears, and a historical survey of operative procedures will be included in the discussion.

COURSE 409

Room 728 Period W-3 or Th-3

JULIUS W. BELL, M.D.
New York

Correction of Outstanding Ears

A new approach for the correction of the outstanding ear is presented.

The auricle is divided into three compartments by two horizontal lines: one at the level of the bifurcation of the crura of the antihelix, the other at the level of the antitragus. The elements in their respective divisions are corrected in orderly sequence with assurance that the normal configuration will be automatically restored as soon as the pathologic factors are removed. If adopted, this technique will be helpful to the beginner in his otoplastic operation.

In the lower compartment, techniques will be given for the correction of the forward cocking of the lobule, the cauda helicis and the conchal structures medial to the antitragus.

In the middle compartment, procedures will be presented for reconstruction of the scaphoconchial and cephaloconchal angles.

In the upper compartment, the management of the superior and inferior crura, the triangular fossa and the helix will be discussed in detail.

COURSE 410

Room 724 Period W-2 or Th-2

RICHARD J. BELLUCCI, M.D.
New York

Surgery of the Stapes and Oval Window

The surgically important anatomic characteristics of the tympanic membrane, stapes, oval window, and other structures in the operation for mobilization of the stapes will be discussed.

The technical considerations involved in performing the operation on the stapes and oval window will be discussed. An evaluation of the advantages and limitations of this surgical procedure will be presented.

COURSE 411

Room 728 Period T-3

NATHAN A. BOLOTOW, M.D.
Providence, R. I.

Rhinoplasty: Recent Advances

Any applied art, such as rhinoplasty, becomes obsolete within a few years because of the constantly increasing information, the modification of the surgeon's view, and his greater experience. An attempt will be made to present the newer

concepts and techniques in the process of shortening the nose, modeling the lobule, narrowing the nasal pyramid, and hump removal. Unsolved problems in rhinoplasty will be discussed.

COURSE 412

Room 731 Period T-1

JOHN E. BORDLEY, M.D.
Baltimore

Deafness in the Infant and Preschool Child: Etiology

This hour will be devoted to information which has been assembled over the past six years regarding a large group of preschool children with severe communicative handicaps. Special emphasis will be placed on the etiologic factors that apparently have been associated with the hearing problem. Correlation will be made of the type of hearing loss with the etiologic factor under consideration. There will be discussion of the type of history and the type of examination to be undertaken by a clinician to help in the diagnosis of hearing loss in such children.

COURSE 413

Room 740 Period W-1

WESLEY H. BRADLEY, M.D.
Syracuse, N. Y.

Practical Office Speech Audiometry

The use of speech audiometry has become established as one of our most helpful diagnostic tools. Yet, many practicing otolaryngologists have completely disregarded its use because of the mistaken belief that speech audiometry requires extensive space, expensive equipment, and many extra hours for testing. In this course, I shall attempt to show how speech audiometry can be done in a very practical manner by the average otolaryngologist without extensive space changes and equipment additions. Illustrative cases will be used to show some of the diagnostic rewards obtained from its use.

COURSE 414

Room 728 Period W-2

FRIEDRICH S. BRODNITZ, M.D.
New York

Actor and Singer as Patients of the Otolaryngologist

Singers and actors form a group of growing importance in the practice of the laryngologist. To handle these patients well requires an understanding of the techniques involved in the professional use of the voice and of the medical, occupational and psychological problems of the artist.

A review of this field will be presented by dealing with the following topics of practical importance:

1. Check-up examination of the vocal organs
2. Technical problems of professional singing and speaking
3. Infection in the vocal organs of the artist
4. Evaluation of local treatments
5. Handling of emergencies
6. Judging the fitness to perform
7. Psychology of the artist-patient
8. Differential diagnosis of functional voice disturbances

COURSE 414-A

Room 721 Period Th-2

RAYMOND CARHART, Ph.D.
Evanston, Ill.
BY INVITATION

Auditory Tests in Diagnosis

Lesions at various sites within the auditory mechanism are characterized by distinct patterns of auditory test results. By administering a battery of special tests, including Bekesy audiometry, loudness balance, SISI, and distorted speech tests, lesions in the middle ear, cochlea, eighth nerve, and central auditory pathways may be effectively differentiated.

No single test can be relied on in all cases, but by the use of a sufficiently diversified battery, reliable and meaningful patterns may be identified.

COURSE 415

Room 727 Period W-1 or Th-1

AUGUST P. CIELL, M.D.
Philadelphia

Hypnosis in Otolaryngology

The phenomenon of suggestibility and the hypnotic trance has been known for thousands of years, but it has only recently been accepted as a useful adjunct to medical therapy.

The otolaryngologist can master this art with a minimum of effort. In his office he may induce safe anesthesia and remove the gag reflex and annoying anxiety symptoms. In the operating room he can effectively alleviate preoperative anxiety and postoperative pain.

In this course an attempt will be made to cover the use of hypnosis in otolaryngology, and tests for suggestibility, using members of the course for subjects, will be demonstrated. A quick and practical method for inducing the hypnotic trance will be demonstrated if time allows.

COURSE 416

Room 712 Period W-3

EDWIN W. COCKE, JR., M.D.
Memphis

Salivary Gland Tumors: Management

The differential diagnosis, surgical anatomy, and surgical procedures pertaining to salivary gland tumors will be discussed.

The management of parotid salivary tumors and the related facial nerve will be emphasized. The material to be presented is not new and is not meant for instruction of those who feel that they can now confidently perform these operations. The material will be illustrated on 35 millimeter slides.

COURSE 417

Room 721 Period W-3

CLAUDE C. CODY, III, M.D.
Houston, Texas

Eustachian Tube: Management of Pathologic Conditions

Management of pathologic conditions of the eustachian tube is a subject that confronts every practicing otolaryngologist. Unfortunately, many symptoms are erroneously attributed to the eustachian tube when this is not the real seat of trouble.

A working classification of lesions of the eustachian tube, suppurative and nonsuppurative, in both the young and old, will be offered. Kodachrome slides which show various stages of retraction and various stages of effusion in the eardrums of children will be shown. The relationship of such conditions to hearing will be stressed. Management, including adenoidectomy, myringotomy with suction, inflation, and the possible use of radium and roentgen therapy will be covered. Our changing concepts regarding suppurative otitis media and serous otitis media and their relationship to hearing will be developed.

Serous otitis media and adhesive otitis media, and the problems they present in adult patients, will be dealt with along with various methods of management.

Vertigo and its possible relation to tubal obstruction will be reviewed. Special emphasis will be placed on office management of tubal obstruction. The methods for its diagnosis and treatment will be thoroughly covered. A short motion picture on equipment and technique used in the management of tubal obstruction in routine office practice will be shown.

COURSE 418

Room 728 Period T-1

WESLEY E. COMPERE, JR., M.D.
Los Angeles

Radiologic Examination of the Mastoid, Middle Ear, and Eustachian Tube

The equipment, positions, and techniques necessary for the visualization of disease in the tympanic cavity, attic, and aditus will be described, as well as the radiologic methods of evaluating function of the eustachian tube. When possible, the radiographic findings will be correlated with the surgical findings, procedures, and results.

COURSE 419

Room 738 Period W-3

DONALD A. CORGILL, M.D.
Dallas

Radical Hypopharyngeal Surgery Combined with Neck Dissection

Patients when first seen by the laryngologist are often suffering from advanced stages of carcinomatous disease of the hypopharynx involving the larynx, pharynx, tonsil, base of the tongue, with local metastasis to the neck already present on either one or both sides. A one-stage surgical procedure adequately encompassing all malignant tissue, together with methods of primary (aortic homograft) or secondary reconstruction, immediate and long-term postoperative results, complications, including the problem of the carotid artery, and methods of dealing with them, will be described with the aid of color slides and a colored motion picture of the operations and of the complications. Time sequence photography has been applied to the resolving complications. The results of such very radical procedures during an eleven-year experience will be presented.

COURSE 420

Room 727 Period T-1

JOHN F. DALY, M.D.
New York

JOHN C. CARDONA, M.D.
Nyack, N. Y.

Corrosive Esophagitis: Recent Advances in Management

The primary object in the management of corrosive esophagitis due to ingestion of acids and alkalies is the prevention of stricture formation. Results of treatment with antibiotics, steroids and prophylactic dilatation at the New York University-Bellevue Medical Center will be presented. Diagnosis and management of complications will be covered.

COURSE 421

Room 713 Period T-3

KENNETH D. DEVINE, M.D.
Rochester, Minn.

Total Laryngectomy: Anatomy and a Technique

This course will consist of a short history of the operation, laryngectomy, a motion picture showing a technique of total laryngectomy, and a lecture on the pertinent anatomy illustrated with lantern slides.

COURSE 422

Room 721 Period T-1 or W-1

DAVID D. DeWEESE, M.D.
Portland, Ore.

The Problem of the Dizzy Patient

This course will include a discussion of the factors to be taken into consideration in making a differential diagnosis of the patient who comes to the physician with the complaint of "dizziness." There will be remarks on the importance of certain facets of history taking. There will also be a discussion of nystagmus and of the value and interpretation of labyrinthine tests. A workable outline of those diseases and conditions which must be taken into account when considering the symptom of dizziness will be presented. An attempt will be made to keep in mind those practical points which are of value in differential diagnosis of this symptom in everyday practice. Treatment of certain types of dizziness and vertigo will be considered.

COURSE 423

Room 727 Period Th-2

JOHN T. DICKINSON, M.D.
Pittsburgh

Saddle Nose

This common nasal deformity will be discussed from a standpoint of etiology, prevention, and correction. The correction of coexisting or secondary deformities will be given first attention. Local tissue replacement with osteoplastic and chondroplastic techniques will be considered along with the use of cartilage flaps from the upper and lower lateral cartilages. Grafts to be discussed will include autogenous cartilage and bone and homogenous cartilage and bone. Acrylic will be the only foreign body implant discussed. The fundamental principles in the use of these materials will be given and their relative merits weighed.

COURSE 424

Room 732 or Room 738 — Period W-3 or Period Th-1

JOHN B. ERICH, M.D.
Rochester, Minn.

Fractures of the Facial Bones

This course will deal with fractures involving the mandible, maxilla, malar and nasal bones. The methods of treatment which have been found most effective at the Mayo Clinic will be stressed, and classifications which facilitate the management of some of these traumatic injuries will be discussed.

COURSE 425

Crystal Room — Period T-1

J. BROWN FARRIOR, M.D.
Tampa, Fla.

Tympanoplasty in 3-D:
Surgical Pathology and Technique

Detailed interpretation of the existing surgical pathology is the basis of sound surgical judgment. The purpose of this course is to demonstrate the variations in surgical pathology of the middle ear which have been responsible for success or failure of tympanoplastic surgery.

The cases will be presented in order of the complexity of the pathology, as follows:

I. Canal Lesions

II. Central Perforations

III. Central Perforations with Cholesteatoma

IV. Small Attic Perforations with Cholesteatoma

V. Middle Ear Cholesteatomas from Secretory Otitis

VI. Middle Ear Cholesteatomas, Tympanoplasties, Types II, III, and IV

VII. Traumatic Marginal Perforations

VIII. Suppurative Labyrinthitis in Geriatrics

COURSE 426

Crystal Room — Period T-2

J. BROWN FARRIOR, M.D.
Tampa, Fla.

Stapes Operations 1960: Pathologic Indications For Bypass Surgery and Vein Graft

The thesis of this presentation is the specific pathologic indications for the various operations on the stapes and oval window.

The anterior crurotomy, with mobilization and impaction of the posterior half of the stapes, is preferred in all anterior lesions. The technique of the anterior crurotomy is presented. A total mobilization of the stapes is not performed as an operation of choice.

Artificial crura of polyethylene or stainless steel are indicated in bicrural otosclerosis.

Subtotal footplate fenestration with gelfoam implant is indicated in thin footplate otosclerosis when the marginal mucous membrane can be preserved. Fenestration of the oval window and vein graft are indicated in complete thick footplate otosclerosis.

The surgical pathology of the stapes is described along with the appropriate surgical technique.

COURSE 427

Room 738 Period W-1

RICHARD T. FARRIOR, M.D.
Tampa, Fla.

A Method of Otoplasty

A new technique for producing normal contour of the antihelix and scaphoid fossa in the correction of protruding ears will be presented. Detailed attention will be given to the anatomy of the average normal ear. Cadaver sections will be used for illustration.

A critical comparison will be made of the currently used techniques and the method presented. A historical review of the operation will be outlined and the shortcomings of earlier procedures pointed out. Errors in technique and additional combined techniques will be incorporated.

The course will be illustrated by color transparencies of the anatomy, surgical technique of the actual operation, and surgical results, with emphasis upon normal contour as seen from the side.

COURSE 428

Room 715 Period Th-3

RICHARD T. FARRIOR, M.D.
Tampa, Fla.

Cancer of the Head and Neck

Color transparencies representing common and unusual lesions from each of the anatomic areas of the head and neck are presented. Photographs made during surgery, representing particular techniques extending from simple outpatient procedures to major en bloc combined neck resections, are presented. Original techniques are incorporated with the currently accepted principles of cancer surgery.

The course emphasizes the need for every otolaryngologist to be familiar with the detection and management of head and neck cancer, whether or not he himself performs the major operation. For the surgeon doing these procedures, a thorough knowledge of the reconstructive aspects involved allows him to be more radical in his initial excision, increasing the cure rate. Some form of primary reconstruction, where there would be a significant disturbance in function without its use, has much in its favor. If reconstruction would alter in any way the main objective of curing the cancer, it should not be given any consideration.

COURSE 429

Room 738 Period T-1

MORRIS FISHBEIN, M.D.
Chicago
BY INVITATION

Medical Writing

The course will follow in outline the textbook entitled Medical Writing: The Technic and the Art. The discussion will concern types of papers accepted by various publications, the preparation of charts, tables, and illustrations, the use of protocols of experimentation, and the technique of the case report.

COURSE 430

Room 740 Period W-3

G. SLAUGHTER FITZ-HUGH, M.D.
WALTER C. McLEAN, M.D.
Charlottesville, Va.

Salivary Glands: Common Disorders

A classification of the salivary glands will be presented for consideration. The recognition, diagnosis, and treatment of some of the more commonly encountered disorders will be discussed. No effort will be made to consider the more unusual conditions. Pertinent facts will be illustrated by projected diagrams, tables and photographs. The comments will follow very closely the abstract prepared for distribution to the students participating in the course.

COURSE 431

Room 743 Period T-2

G. SLAUGHTER FITZ-HUGH, M.D.
WALTER C. McLEAN, M.D.
Charlottesville, Va.

Cancer of the Nasal Accessory Sinuses.

The subject of cancer of the sinuses will be presented with the aid of projected charts, tables, and photographs. The nasal, oral, and ocular symptoms and signs will be presented in some detail. It will be shown that usually the diagnosis is fairly obvious but occasionally the pathologist has difficulty in establishing a correct, early diagnosis in certain cases. Diseased conditions simulating cancer will be mentioned and illustrated. The several various plans of treatment will be discussed.

COURSE 432

Room 721 Period T-2

EDMUND P. FOWLER, JR., M.D.
New York

Facial Paralysis

This course will include discussion of the following points:

1. Etiology of neuritis of the seventh nerve
2. Bell's palsy
3. Traumatic injuries of the facial nerve, including those instant to fracture of the temporal bone
4. Tumor invasion

Special attention will be paid to the pathologic changes incident to repair and methods of decompressing and grafting the nerve. There will also be a discussion of the medical management of Bell's palsy, postrecovery associated movements, and involuntary twitches or tics.

COURSE 433

Room 722 Period T-1

A. C. FURSTENBERG, M.D.
Ann Arbor, Mich.

Management of Nasal Obstruction

A discussion of nasal obstruction will stress the reflex and inflammatory symptoms of this disorder. Particular emphasis will be placed upon the role of the turbinates in nasal obstruction and its symptoms. Allergic factors will be referred to in a consideration of adequate and effective treatment.

COURSE 434

Room 710 Period Th-2

ARAM GLORIG, M.D.
Los Angeles

The Otolaryngologist and Hearing Aid Selection

The purpose of this course will be to answer many of the questions surrounding selection of a hearing aid, especially those which the "hearing loss patient" directs to the physician when he is informed that a hearing aid will be necessary.

COURSE 435

Room 722 Period W-1
or or
Room 733 Period Th-1

IRVING B. GOLDMAN, M.D.
New York

Correction of the Deviated Nose

Reparative surgery for the deviated nose improperly carried out may change a moderate or severe deformity into a major defect. This causes physiologic disturbances superimposed on unsatisfactory esthetic results. The deviated nose is invariably associated with a deflected septum; both can be advantageously corrected at one operation by the procedure to be outlined. Restoration of normal intranasal as well as extranasal contour of the deviated nose is accomplished with a technique based on the principle of shifting displaced parts while maintaining support of the basic areas. Correction of the deviated nose with avoidance of "saddling," drooping of the tip and retraction of the columella can thus be achieved.

COURSE 436

Room 733 Period W-1

JOSEPH L. GOLDMAN, M.D.
New York

Nasal Disorders:
Current Concepts in Management

This course will deal with pertinent current physiologic, diagnostic and thera-

peutic concepts and considerations of nasal and sinus disorders of vasomotor and infectious origin. Special attention will be paid to precise differential diagnostic procedures and surgical techniques.

COURSE 437

Room 710 Period T-1 or Th-1

VICTOR GOODHILL, M.D.
SEYMOUR J. BROCKMAN, M.D.
Los Angeles

The Articulated Prosthesis in Stapes Surgery

With the present evolutionary changes in stapes surgery in otosclerosis, our present basic plan is as follows:

1. In cases where there is no invasion of either crus and where the central portion of the footplate is still translucent, the standard peribasal chisel technique is still employed. This method is effective in a small percentage of cases, but in these specific cases it is just as effective as far as long range results are concerned, as the prosthetic approach to be described below.

2. Prosthetic stapediolysis employs an articulated polyethylene prosthesis, which is so fashioned as to become attached to the incus for push-pull dynamics. The oval window segment of the prosthesis is prepared in each instance to fit specific needs.

It is the conviction of the authors that radical oval window surgery is not indicated in most cases, and that conservative approaches will probably be safer and more effective from a long-range point of view. Evidence along these lines will be presented.

COURSE 438

Room 713 Period T-2

ARTHUR J. GORNEY, M.D.
Boston

Septum Surgery in the Twisted Nose

For the patient with a straight bony nose, whose septum is deviated and dislocated, with a typical twisting of the cartilaginous portion of the nose, rhinoplasty is often unnecessary or possibly not desired by the patient. This course will describe the details of an operation designed to correct the deviation of the septum along with the dislocation of the caudal end of the septal cartilage, at the same time straightening the twist of the lower part of the nose, without performing rhinoplasty. The operation has been taught for a number of years at the Boston City Hospital to the residents in otolaryngology, and has been performed successfully by them long before they could possibly qualify to do rhinoplasty.

This operation can therefore be used by the otolaryngologist whether he does rhinoplasty or not, to do adequate septum surgery on these cases without performing the rhinoplasty procedure. To many patients, this would be much more satisfactory. The general principles of the operation are also incorporated in the rhinoplasty operation, when indicated.

COURSE 439

Room 721 Period T-3

EUGENE L. GRANDON, M.D.
Iowa City

Plastic Surgical Procedures for the Otolaryngologist

Numerous lesions and minor deformities about the face and neck can easily be managed by the otolaryngologist. One must have a knowledge of skin grafting and the proper use of flaps to handle these cases adequately.

A variety of procedures will be described with actual case illustrations.

COURSE 440

Room 722 Period W-3

PAUL GUGGENHEIM ,M.D.
Council Bluffs, Iowa

Technique and Pitfalls of Adenoidectomy

1. Brief historical survey, mentioning the works of von Gyergyai, Yankauer, Lothrop, Holmes, Beck, Kelly, Love, L. K. Guggenheim, Meltzer and others.

2. Methods of clinical examination of the nasopharynx: mirror examination, electric nasopharyngoscope, direct exposure with palate retractor, radiography.

3. Operative prerequisites: illumination, position of patient and surgeon, instrumentarium.

4. Technique of direct exposure of nasopharynx for biopsy of Rosenmueller's fossa and for direct adenoidectomy. Unique features of the direct view and resulting feelings of estrangement on part of the surgeon.

5. Techniques of excision of adenoid tissue, use of scalpel or scissors, curet, adenotome, punch forceps.

6. Histopathology of the lateral adenoid and its bearing on the question of irradiation versus surgery.

7. Brief mention of the role of unresorbed mesenchyme in conductive deafness in children, and the role of tubal dilatation in its treatment.

8. Otologic results.

9. Complications.

COURSE 441

Room 732 Period T-1 or Th-1

FREDERICK R. GUILFORD, M.D.
WILLIAM K. WRIGHT, M.D.
Houston, Texas

Controlled Healing of Tympanoplasty And Mastoid Cavities

This is a discussion of obliterative techniques used to ensure small mastoid and tympanoplasty cavities, allowing for more rapid and controlled healing of the cavity. Emphasis is placed on obtaining a small cavity completely lined with squamous epithelium within five weeks postoperatively. The potential cavity following mastoidectomy or tympanoplasty is made smaller when necessary by partial or complete obliteration of the mastoid bowl by swinging a pedicle of soft tissue into the defect from the postauricular subcutaneous tissue. A cavity approximating the size of the normal external auditory canal is the desired result.

Complete healing of the resultant cavity is effected in 90 per cent of the cavities within five weeks after operation, thus avoiding a long course of postoperative care and recurrent suppuration.

COURSE 442

Room 732 Period Th-3

FREDERICK R. GUILFORD, M.D.
WILLIAM K. WRIGHT, M.D.
Houston, Texas

Stapes Mobilization Techniques

This course will review our experience with the various techniques of stapes mobilization, from the original Rosen technique through the Shea stapedectomy with vein graft operation. Results obtained with each technique, including complications, will be reviewed.

Illustrations will include color slides depicting various types of otosclerotic involvement of the middle ear as well as congenital anomalies encountered in our series.

Details concerning our present method of selection of patients for stapes mobilization will be discussed. Our personal experience with the stapedectomy operation will be reviewed in detail, including techniques, problems encountered and postoperative results.

COURSE 443

Room 740 Period T-2

O. ERIK HALLBERG, M.D.
Rochester, Minn.

Severe Nosebleed

Severe nosebleed requires prompt and decisive action by the rhinologist. The tendency has been to make more extensive use of surgical intervention. However treatment varies greatly depending upon the site of the bleeding. The different types of medical and surgical treatments will also be discussed in detail.

COURSE 444

Room 738 Period W-2

O. ERIK HALLBERG, M.D.
Rochester, Minn.

Sudden Deafness

Sudden unilateral or bilateral impairment of hearing is a symptom, not a disease. It is very distressing, alarming to the patient, and deserves our most careful attention. The pathology, etiology, diagnostic factors and other pertinent data will be discussed. The most common cause of sudden deafness is thought to be vascular accident involving the blood supply to the cochlea, the equilibratory labyrinths, or both.

There is some evidence to show that patients so afflicted are more susceptible than the average patient to the development of other vascular accidents later in life. Treatment and type of examination needed will also be discussed in detail.

COURSE 445

Room 738 Period T-3

HERBERT P. HARKINS, M.D.
Philadelphia

Routine Office Management of Allergic Patients

The modern otolaryngologist daily sees patients who are suffering from allergies of the ear, nose and throat. It is essential that he be able to diagnose these conditions accurately and to outline effective and complete therapy.

The essential features of the following procedures will be discussed:

1. History taking
2. The clinical examination of the ear, nose and throat
3. Necessary laboratory studies to be performed in the office
4. Skin testing
5. Desensitization, both standard and high dilution
6. Elimination diets
7. Office surgical procedures

The course will be illustrated by lantern slides which show necessary equipment and techniques.

COURSE 446

Room 738 Period Th-2

JEROME A. HILGER, M.D.
St. Paul, Minn.

Office Diagnostic Methods and Treatments

Diagnostic procedures in sequences valuable in the otolaryngologic office examination comprise the major portion of the hour. References to therapy will be in general terms rather than specific formulas.

COURSE 447

Room 724 Period T-1

RAYMOND L. HILSINGER, M.D.
Cincinnati

Vascular Headaches

In the far past all complicated headaches were considered migraine. In the more recent past, since the work of Horton, Wolff and Friedman, much has been done to classify the various types of vascular headaches. However, the pendulum, as usual, has swung too far to the other side, and now there is far too much classification. If this continues, each little cranial artery will have its own headache syndrome.

In this course a very simple classification of vascular headaches will be proposed, and general diagnosis and treatment of both vasodilating and vasospastic headaches will be discussed. The symptomatic and prophylactic aspects of treatment will be considered.

COURSE 448

Room 722 Period Th-1

JACK V. D. HOUGH, M.D.
Oklahoma City

Anatomic Variations in the Middle Ear: Their Significance in Stapes Mobilization

The numerous procedures to restore function to the conductive mechanism of the middle ear have produced urgent demands for more information regarding the variations one might encounter when

the eardrum is elevated and the mechanism of the middle ear is viewed. In modern otology, micro-orthopedics and plastic revisions of delicate proportions must be performed. This work requires basic knowledge in middle ear variations. Otherwise, a slight distortion or absence of a landmark may be a mechanical pitfall with an undesirable result.

Reports of middle ear malformation unassociated with other known defects have been extremely rare in the past; however, they are much more common than has been realized. A large number and a large variety of significant defects have been observed in a series of 500 transaural tympanotomies. These will be presented with kodachrome slides and illustrations. Embryology, diagnostic problems, etiologic factors and surgical corrective measures will be discussed.

COURSE 449

Crystal Room — Period Th-3

HOWARD P. HOUSE, M.D.
Los Angeles

Stapes Mobilization Procedure: Personal Experiences

Changing trends in stapes mobilization will be discussed. The current techniques will be reviewed, based on a statistical analysis of our series of mobilized cases, including surgical revision and the use of plastics.

COURSE 451

Room 713 — Period Th-3

FORDYCE JOHNSON, M.D.
Pasadena, Calif.

Tonsillectomy and Adenoidectomy

Present day advancement compels the specialist to be better in his field than the general practitioner. Today the otolaryngologist should be able to show superior skill in tonsillectomy and adenoidectomy over his nonspecialist competitor. This course will show you the way to do just this, not only in the surgical procedure, but also in the preoperative and postoperative care of the patient.

The discussion, aided by slides and motion pictures, will include the advantages of the surgeon sitting at the head of the operating table, the pros and cons of intubation in tonsillectomy and adenoidectomy, the examination of the adenoid area, nasopharynx and posterior nostrils, and the control of bleeding. The proper handling of the patient preoperatively and postoperatively with a discussion of fluids, electrolytes, metabolism, and catabolism as it applies to these operations will also be presented.

COURSE 452

Room 715 — Period W-1 or Th-1

EDLEY H. JONES, M.D.
Vicksburg, Miss.

External Otitis: Suggestions for Improvement in Diagnosis and Therapy

External otitis continues to be a troublesome problem, and this course will be directed toward more satisfactory management.

Numerous studies have been made by many investigators, and the more pertinent studies will be reviewed.

Emphasis will be placed on the basic concept that external otitis is a dermatological problem, and a simple etiologic classification will be presented. This will be supported by review of recent histopathologic studies of typical chronic and acute cases.

Specific diagnosis should be based on these fundamental principles, correlated with the history, clinical findings and indicated clinical laboratory examinations. Correct diagnoses and clinical experience will indicate more specific therapy, with quicker relief and better results.

Patients should not be discharged until they are instructed in the proper care of the external ear in order to prevent recurrences. Many, perhaps most, of our cases are acute episodes of a chronic dermatitis, and such instruction is particularly indicated in these cases.

COURSE 453

Room 733 — Period T-2

LEWIS W. JORDAN, M.D.
Portland, Ore.

Recent Nasal Fractures: Management

Recent advances in rhinoplasty by otolaryngologists for the improvement of nasal function have directed attention to more precise methods for the handling of nasal fractures. The proper management of these injuries will prevent much later disability.

This course will present a practical approach to the management of the fractured nose. It will include discussion of (1) pathologic changes; (2) methods of making an early diagnosis; (3) use of local anesthesia; (4) correction of displaced bony fragments; (5) reduction of septal fractures; (6) open reduction in cases which cannot be corrected by closed methods; (7) application of external and internal dressings; (8) nasal injuries in children; and (9) old fractures.

COURSE 454

Room 732 Period T-3

RAYMOND E. JORDAN, M.D.
Pittsburgh

Meniere's Disease: Diagnosis and Treatment

This course will cover the management of the patient with Meniere's disease. Diagnosis and therapy, both medical and surgical, will be presented. Discussion of medical therapy will be confined to the methods used by the author. Discussion of surgical management will include selection of cases for operation and procedures used. Long-term results of this type of management will be presented.

COURSE 455

Room 716 Period T-3 or W-3

ARTHUR L. JUERS, M.D.
Louisville, Ky.

Perforations and Hearing Conservation Surgery

The "marginal eversion" method of office closure for central tympanic perforations will be described. Selection of cases for office closure and graft closure technique will be discussed. The genesis of attic cholesteatoma will be considered with emphasis on indications for surgical intervention, possibilities of preserving or restoring hearing as well as getting a dry, safe ear when surgical treatment is indicated. Selected case reports will be used to illustrate problems of prognosis and technique.

COURSE 456

Room 734 Period W-3

JOSEPH I. KEMLER, M.D.
Baltimore

Diagnostic and Therapeutic Aids in the Practice of Otolaryngology

As related to:

1. Epistaxis
2. Acute and chronic sinusitis
3. Submucous resection
4. Lacrimal disorders
5. Focal infections
6. Retropharyngeal and parapharyngeal infections
7. Indirect laryngoscopy
8. Differentiating functional and organic maladies of the larynx
9. Meniere's syndrome

COURSE 457

Room 710 Period W-2

JOHN A. KIRCHNER, M.D.
New Haven, Conn.

Facial Bone Injuries

Trauma to the zygoma, maxilla or nose produces characteristic deformities in the middle third of the face. These changes may be obscured by hematoma or edema, but they can usually be found by careful physical and roentgenographic examination. Techniques of examination, methods of treatment, and details of surgical anatomy will be demonstrated by photographs of patients with the various types of injury.

COURSE 458

Room 744 Period T-1 or W-1

CLAIR M. KOS, M.D.
Iowa City

Vein Plug Stapedioplasty

Experience over the past five years with more than one thousand stapes operations, employing various techniques which have been statistically monitored, has led to the development of an improved technique currently used for the correction of hearing impairment due to otosclerosis.

Essentially, this procedure consists of stapedectomy, followed immediately by the insertion of a "vein plug" into the exposed oval window and the creation with a steel wire prosthesis of an incudovestibular arthroplasty which re-establishes the continuity of the ossicular chain. The results evaluated at the same stage of development as in previous techniques are much superior to those obtained heretofore.

Techniques used to remove even the most extensive otosclerotic growths from the oval window without resorting to the diamond burr and drill will be demonstrated. Other technical difficulties in addition to preoperative and postoperative patient care will be discussed.

COURSE 459

Room 732 Period W-2

COL. RALPH N. KRAUS, MC
and
MAJ. JOSEPH A. FUREY, MC
BY INVITATION
Brooks Air Force Base, Texas

Adventures in Space

Is space flight possible? This question is frequently posed to the physician. This course will prepare him to discuss the topic with factual information. The subject of weightlessness will be presented—what it is, how it is attained, as well as how it affects eating, drinking and motor performance.

A brief motion picture will show these activities during the weightless state. Potential astronauts have been observed in a space cabin simulator for periods up to five days. Perceptual aberrations were observed. Psychomotor performance, alertness and changes in day-night cycling were recorded. The results of training to Coriolis accelerations will be presented. Details of the astronaut program will be discussed.

COURSE 460

Room 710 Period W-3 or Th-3

FRANCIS L. LEDERER, M.D.
Chicago

Diagnostic and Therapeutic Pitfalls in Otolaryngologic Practice

From the very beginning of the interrogation to the culmination of medical and surgical management of the patient, potential mishaps and pitfalls are numerous. Inasmuch as patients seeking the services of the otolaryngologist confront him with symptoms of a varied nature, definitive management entails a matter of well chosen words and carefully selected modalities. In evaluating the challenging array of signs, symptoms, and symptom-complexes—headache, nasal blockage, dizziness, dysphagia, sore throat, otalgia, hoarseness, aural or nasal discharge, cough, obstructive states of the upper or lower airway, epistaxis, tinnitus, hearing loss, disturbance of facial, orbital or neck symmetry—pitfalls, mistakes, transgressions, accidents, and errors of omission and commission are at times either apparent or evident. Although generally speaking none of these signs or symptoms is in itself diagnostic, all of them require careful evaluation for an accurate diagnosis to aid recovery, preserve function of a special sense organ, or save a life.

In this presentation the potentialities for error (diagnostic, therapeutic and surgical) are illustrated by charts and patient photographs in an effort to learn by the experience of others. Prevention is, after all, a matter of the knowledge that these pitfalls exist.

COURSE 461

Room 733 Period T-3

A. NEIL LEMON, M.D.
Philadelphia

Serous Otitis Media in Children

Serous otitis media accounts for mild to moderate hearing loss in too large a segment of our child population and is too often overlooked. Patients referred for removal of tonsils and adenoids were studied carefully and 17 per cent were found to have serous otitis media.

This course includes a discussion of (1) etiologic factors, (2) bacteriologic, pathologic and chemical studies of the fluid, (3) diagnosis, and (4) management. The recognition of serous otitis media is made simple by careful history, proper examination, and hearing analysis. Effective treatment will be discussed in detail step by step. Most of the ideas offered in this course are visualized in lantern slides. Office care of the condition is minutely described and equipment demonstrated.

Time will be permitted for questions and answers.

COURSE 462

Room 706 Period T-2

MARK H. LEPPER, M.D.
Chicago
BY INVITATION

Antibiotics in Otolaryngology

The use of antibiotics in terms of the known pharmacology, their effects on microbes and the nature of the disease processes will be considered. Thus, the course will include a consideration of the host-parasite, host-drug and drug-parasite relationships, and from these concepts discussion of the following problems will be developed:

1. When should one treat empirically?
2. Estimation of effectiveness of the drug
3. Bacteriologic studies required
4. Are sensitivity studies helpful?
5. What is optimal treatment?
6. When should antibiotics be changed?
7. What are the rules governing the choice of drugs when changes are made?
8. What are the reasons for failure?
9. Drug toxicity and differential diagnosis

COURSE 463

Room 706 Period Th-2

JOHN S. LEWIS, M.D.
New York

Surgery for Advanced Ear Cancer

Cancers of the auditory canal, middle ear and mastoid have seldom been cured by roentgen therapy alone or in combination with a radical mastoidectomy. An operation which has been developed at Memorial Hospital for subtotal resection of the temporal bone has cured many patients with ear cancer.

The approach is a combined intracranial-extracranial surgical resection of the mastoid, middle ear and petrous portion of the temporal bone en bloc. The author will demonstrate the operative technique along with presentation of cases.

COURSE 464

Room 716 Period W-2

PAUL M. LEWIS, M.D.
Pittsburgh

Reactions to Drugs and Antibiotics Used in Otolaryngology

Therapeutic possibilities in otolaryngology have increased many fold in recent years with the addition of antibiotics, steroids, anesthetics and other innumerable new or modified drugs. With widespread use of these new agents, we have been confronted with an increasing incidence of reactions of a toxic or allergic nature. This presentation will cover certain drugs and antibiotics commonly used in practice, and reactions attributed to them. Prevention and treatment of these reactions will be discussed. Proper use of drugs and antibiotics in otolaryngology will be considered.

COURSE 465

Room 706 Period W-2

ROBERT B. LEWY, M.D.
Chicago

Direct Laryngoscopy: Special Techniques

This course will present a method and instruments designed to make the techniques of direct laryngoscopy easier and more accurate. It will include a motion picture demonstration of the chest suspension type of laryngoscopy. It will also show laryngoscopes designed to give a wide field for instrument maneuver, not constricted by a full tube. These function to permit two-instrument work and arytenoidectomy. Ease of method, lack of strain and of the awkward crouch will be emphasized.

Also to be demonstrated will be a method of depth perception for accurate marksmanship with forceps and better visualization and understanding of pathologic changes. Adequate magnification for precise one-forceps or two-instrument work will also be discussed. There will also be a discussion of practical and adequate preoperative sedation, local and general anesthetic.

COURSE 466

Room 715 Period T-1
or or
Room 713 Period Th-1

WALTER E. LOCH, M.D.
Baltimore
BY INVITATION

Septum Deviations: Techniques of Surgical Reconstruction

Techniques for reconstruction of the nasal septum for varying degrees of deviations, obstructions and impactions will be described, including the maxilla-premaxilla approach. Attention will be given to the surgical problems of the anterior part of the septum. The surgical anatomy of the septum and its related structures will be discussed with reference to its influence on the technical procedure and avoidance of possible unfavorable sequelae. The surgical techniques will be demonstrated on the cadaver.

COURSE 467

Room 713 Period T-1

JOHN M. LORE, M.D.
New York

Vascular Surgery in Head and Neck: Techniques

The basic principles involved in vascular surgery will be covered in detail. Vascular instruments, suture material and the types of sutures used will be demonstrated in relation to end-to-end arteriorrhaphy and lateral arteriorrhaphy. The various indications for vascular surgery, viz.: injury to vessels, aneurysms, arteriovenous fistulas, tumor invasion of vessels and obstructive arteriosclerosis, especially in the treatment of stroke, will be discussed. Familiarity with the use of vascular grafts (autogenous, homogenous, heterogenous and synthetic) is an integral part of the armamentarium of every surgeon doing major head and neck surgery. Demonstration will consist of the actual grafts as well as color slides.

COURSE 468

Room 721 Period W-2

JOHN E. MAGIELSKI, M.D.
Ann Arbor, Mich.

Neurogenic Tumors of the Head and Neck

Tumors of neural origin may present diagnostic problems in the head and neck. Because these tumors vary in appearance and presentation, a practical clinical classification of them is of value.

The discussion of these tumors will also involve their recognition and management. Colored lantern slides illustrating pertinent examples will be presented

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COURSE 469

Room 733 Period W-3 or Th-3

JAMES B. McBEAN, M.D.
Rochester, Minn.

Secretory Otitis Media in Children

The course will consist of a lecture and slides covering the etiology, diagnosis and treatment of secretory otitis media in children.

The various appearances of the tympanic membrane in secretory otitis media, the importance of the history, and the role of infection and allergy all will be brought out in the course.

Various methods of treatment with particular emphasis on myringotomy and removal of lymphoid tissue in the nasopharynx will be demonstrated, and photomicrographs of smears of various types of otitis media will be shown.

COURSE 470

Room 733 Period T-1

HOLLIE E. McHUGH, M.D.
Montreal, Que., Canada

Traumatic Conductive Deafness and Facial Paralysis: Surgical Treatment

In closed head injuries, longitudinal fractures of the temporal bone are the most common cause of damage to the structures of the middle ear resulting in traumatic conductive deafness and peripheral facial paralysis. In this type of fracture the facial paralysis is most commonly due to compression of the surgically accessible tympanic portion of the nerve in contrast to the transverse type of fracture of the temporal bone in which the facial nerve is more commonly severed.

There is experimental and clinical evidence that the decompression of the intratympanic portion of the damaged facial nerve before the end of three weeks provides the best results when surgical intervention is indicated. The indications and time for surgical intervention and the method designed to restore not only the function of the facial nerve but also the traumatic conductive deafness will be presented.

COURSE 471

Room 726 Period T-1

JAMES W. McLAURIN, M.D.
THOMAS P. RAGGIO, M.D.
Baton Rouge, La.

The Child Without Speech: Differential Diagnosis and Treatment

The child without speech is encountered by the otolaryngologist today more than ever before. Formerly the physician might have told the parents that a child was too normal otherwise to have anything wrong with his hearing, or that he would probably grow out of his unawareness of sound, or that if his hearing was impaired he must wait until he was 5 or 6 years old before he could be tested. Today this rarely happens. This is as it should be, but in recent years there has been so much emphasis on the testing of young children by special techniques and trick methods that some of us are forgetting basic principles. In this course I shall attempt to present ideas as to how the average otolaryngologist can reach a working diagnosis, and shall offer some suggestions as to the type of therapy indicated.

COURSE 472

Room 712 Period Th-1

S. C. MISSAL, M.D.
Cleveland

The Cervico-Occipital Syndrome: A Neglected Entity

Cervical root compression, the commonest cause of head and neck manifestations of the cervico-occipital syndrome, can cause symptom complexes which mimic a variety of ear, nose, and throat conditions. Such symptoms as vertigo, tinnitus, otalgia, cephalalgia, nuchal pain, sore throats and chest pains simulating cardiac or pulmonary disease may be manifestations of the syndrome. Unless the clinician is aware of such an entity he may make an erroneous diagnosis. Until recently little has been known about this relatively common condition. The course will consist of a discussion of the etiology, symptomatology, diagnosis and treatment of an important yet neglected clinical entity.

COURSE 473

Room 711 Period T-3

DAVID MYERS, M.D.
Philadelphia

The Microsurgery of Otosclerosis

Microsurgery of the middle ear for the relief of otosclerotic deafness has under-

gone radical change since Dr. Samuel Rosen first presented his stapes mobilization operation. Rosen's early tilt technique has provided the basis for the subsequent development by other otologic surgeons of procedures such as pulsating techniques involving the application of pressure upon the incus, stapes head or footplate, as well as the various chisel procedures, Shea's stapedectomy with vein graft technique, the gelfoam and footplate shattering procedures of House, and Hough's concepts of partial stapedectomy.

The purpose of this course is to trace briefly the historical development of otosclerosis surgery and to present a detailed description of the principles and application of the recently developed microsurgical techniques. To be included for consideration are oval window fenestration, total and partial stapedectomy, and the use of vein grafts, gelfoam and plastic prostheses in the restoration of ossicular chain continuity.

Details of surgical technique will be illustrated, using kodachrome slides, and a statistical analysis of surgical results and complications will be presented.

COURSE 474

Room 713 Period W-1

DAVID MYERS, M.D.
and
WOODROW D. SCHLOSSER, M.D.
BY INVITATION

Philadelphia

Surgery of Chronic Otitis Media and Mastoiditis

In view of the fact that surgery of chronic otitis media and mastoiditis now belongs to the realm of microsurgery of the middle ear, in this course the newer techniques of tympanoplasty will be presented. The classification of Professor Wullstein will be used. We hope to present slides and a motion picture of this technique as well as the results obtained. One will note the purpose of this surgical procedure is, first, to control the disease and, secondly, to restore or reconstruct the transmitting mechanism of the middle ear. A technique of myringoplasty utilizing the skin of the external auditory canal will be presented which may be used in certain cases instead of the classical type I of Wullstein and Zollner.

COURSE 475

Room 727 Period T-3

HARRY NEIVERT, M.D.
New York

Intranasal Ethmoidectomy: A Lost Art

The indications for intranasal ethmoidectomy have been decreasing for a long time, even before the advent of chemotherapy and antibiotics. This has resulted in a lack of material for teaching of postgraduates and residents. It was therefore necessary to develop a technique both easy to teach and easy to learn, which would be relatively safe and yet adequate. My operation combines the best methods which I learned and embellished after working and consulting with the foremost American sinus surgeons thirty-five years ago. The essential anatomy will be shown, and the danger areas which must be avoided will be demonstrated. The steps in the orderly technique of a definitive intranasal ethmoidectomy will then be easily mastered.

COURSE 476

Room 724 Period W-3

JOSEPH H. OGURA, M.D.
St. Louis
MAX L. SOM, M.D.
New York

Conservation of Laryngeal Function in Cancer of the Larynx

Wide excision of more than limited cancerous lesions of the vocal cords and epiglottis can be obtained in selected cases without sacrificing laryngeal function. Cordal lesions which are too extensive for routine cordectomy via thyrotomy can be adequately excised by special procedures. The indications, technique and results of hemilaryngectomy for cordal carcinoma with extension posteriorly onto the arytenoid or laterally into the ventricle will be presented. The surgical treatment of anterior commissure lesions with bilateral thyrotomy and avoidance of stenosis by use of the McNaught tantalum splint will be discussed.

Lateral pharyngotomy as a surgical approach for extirpation of selected cases of carcinoma of the epiglottis will be illustrated. The indications, technique and results of subtotal suprahyoid laryngectomy with simultaneous neck dissection will be demonstrated. An analysis of the failures, with emphasis on the value of elective neck dissection, will be shown. The value of roentgen therapy for cordal lesions will also be discussed briefly.

COURSE 477

Room 711 Period Th-3

JOSEPH H. OGURA, M.D.
St. Louis

Radical Neck Dissection and Laryngeal Carcinoma

Carcinoma involving the larynx is usually best handled by radical extirpation. Lesions of the endolarynx and the subglottic area should be treated by total laryngectomy and radical neck dissection whether nodes are palpable or not. On the other hand, when the true cord or arytenoid is not involved, primary tumors of the pyriform sinus can be surgically removed by the transhyoid pharyngotomy approach. Carcinoma of the epiglottis without cordal involvement can be removed by the supraglottic subtotal laryngectomy and radical neck dissection procedure.

The various methods of handling tumors in this area will be discussed and techniques outlined by lantern slides and motion pictures.

COURSE 478

Room 732 Period T-2

PETER N. PASTORE, M.D.
Richmond, Va.

The Throat: Nonsurgical Problems

The discoveries and writings of the past twenty-five years have disclosed multiple factors contributing to symptoms and related sensations of the pharynx previously classified as neurotic.

There are many functional conditions in the region of the throat which, on first glance or superficial thought, lend themselves to the diagnosis of globus hystericus or a neurosis of one kind or another. A study of the sensory and other neural pathways supplying the pharynx and adjacent structures would disclose that there is a logical explanation for many of these symptoms. This is particularly true in reference to the common complaint of a "lump in the throat."

An effort to define the term "throat" properly and a general discussion of certain observations over a quarter of a century will be presented.

COURSE 479

Room 728 Period T-2

SAMUEL J. PEARLMAN, M.D.
Chicago

Certain Aspects of Aging in the Ear, Nose and Throat Regions

The intent of this presentation is to clarify ideas and to determine an approach to practical therapy.

The topics discussed will include dizziness in the aged, presbycusis and accompanying tinnitus; dry mouth; sore tongue; varicosities and painful papillas of the tongue; and nosebleed in the aged.

Lantern slides will be shown.

COURSE 480

Room 722 Period W-2

HENRY B. PERLMAN, M.D.
Chicago

Fluid in the Middle Ear: Etiology and Management

Different kinds of fluid may be found in the middle ear and adjacent air cells. Each kind is associated with a particular pathogenesis. A clear understanding of the normal and pathologic physiology of the eustachian tube is essential to the interpretation of this group of ear diseases. The recognition of their more subtle changes and their relation to deafness is sometimes difficult. Careful observation of the natural course of the various disease states is also important in understanding indications and prospects of therapy. Experiences with some unusual cases seen during the past few years will be reviewed. A motion picture will be presented.

COURSE 481

Room 711 Period W-3

WALTER A. PETRYSHYN, M.D.
Flemington, N. J.

The Fractured Mandible

This course is designed for the otolaryngologist who may find it necessary to handle the problem of the fractured mandible. It will include:

1. Presentation of the surgical anatomy of the mandible and its occlusal relationship to the maxilla

2. Demonstration on specimens of basic techniques of interdental and arch bar wiring

3. Illustration and evaluation of some of the techniques used in the open reduction of the fractured mandible

4. Treatment of specific fracture problems

COURSE 482

Room 743 Period T-3 or W-3

BRUCE PROCTOR, M.D.
Detroit

Tympanoplasty

The combination of surgery for the control of middle ear inflammation and preservation or restoration of hearing is referred to as tympanoplasty. Hearing may be improved by reconstructing the sound mechanism for transmission of sound waves to the oval window and by restoration of sound protection for the round window. The following aspects will be discussed: (1) surgical anatomy of the middle ear; (2) physiologic objectives; (3) analysis of the pathologic changes and status of the middle ear before and during the surgical procedure; (4) the techniques employed in the various types of tympanoplasty; (5) a critical survey of the results achieved; and (6) analysis of failures.

COURSE 483

Room 713 Period Th-2

BRUCE PROCTOR, M.D.
Detroit

Surgical Anatomy of the Temporal Bone

The use of the modern operating microscope has necessitated reconsideration of the anatomy of the ear as seen under the magnification that we are working with at present. Particular attention will be paid to the minute structures in the middle ear which are frequently encountered and also some consideration will be given to the various anomalies. The surgical anatomy of the region of the windows, the sinus tympanicus, the epitympanum and the hypotympanum. The information will be correlated with the surgical anatomy previously used in temporal bone work.

COURSE 484

Room 721 Period Th-1

G. O. PROUD, M.D.
Kansas City, Mo.

Middle Ear Effusion

The etiologic factors involved in the genesis of middle ear effusion will be discussed, and the prognosis as it relates to these factors will be presented. Helpful methods of early recognition of the condition will be outlined, and a rational approach to therapy introduced.

The results of eustachian tube cultures and micropathologic studies of the middle ear mucosa will be used as scientific support of the material presented.

COURSE 485

Room 738 Period Th-3

WILLIAM F. RABBETT, M.D.
New York

Submucous Resection of the Nasal Septum

Surgical anatomy of the nasal septum and framework of the external nose will be reviewed.

A simplified technique for the surgical correction of the deviated nasal septum, as taught at the Manhattan Eye, Ear and Throat Hospital, will be presented.

Surgical management of the anterior deviated nasal septum with obstruction of the nares will be considered.

The relative importance of the septum in plastic surgery of the nose will be discussed.

COURSE 486

Room 731 Period W-1

AUBREY G. RAWLINS, M.D.
San Francisco

The Corticosteroids in Otolaryngology

In general, the corticoids function in maintaining a normal structure in the mesenchymal tissues. However, we seldom use them in a physiologic manner. We use them in pharmacologic doses. In the practice of otolaryngology, the corticoids are used mainly as anti-inflammatory agents. Inflammation will be discussed and explained. The dangers of using these hormones will be discussed. How do we prevent these dangers? Is the length of the treatment more important than the size of the dose? Does cortisone have advantages over the newer products? Relationship between corticoids and thyroid will be discussed as well as the following factors: difficulty in diagnosing hypothyroidism; basal metabolic rate and protein bound iodine test not accurate (a simple and more accurate test described); definite indications for the use of the corticoids; questionable indications; contraindications; questions to be asked of the patient before using corticoids; special tests; specific dosage.

COURSE 487

Room 727 Period T-2

GEORGE F. REED, M.D.
Boston

Neck Dissection

This course will attempt to present in a simplified, step-by-step fashion, a technique for routine radical neck dissection. The technique has been so organized as to make step-by-step approach feasible, easy to apply, and easy to remember. The various steps will be outlined and demonstrated in both still and motion picture photography.

COURSE 488

Room 743 Period W-1

SCOTT N. REGER, Ph.D.
Iowa City

Practical Office Audiometry

This course will comprise (1) the common sources of error in audiometry; (2) an adequate testing procedure; (3) the use of masking while obtaining air and bone conduction measurements; and (4) interpretation of audiograms.

COURSE 489

Room 734 Period T-3

HERBERT J. RINKEL, M.D.
Kansas City, Mo.
BY INVITATION

The Diagnosis of Food Allergy

PART I:

A. An evaluation of the function and limitations of history taking.
B. The use and value of skin tests.
C. Evaluation of the cytotoxic cell test.
D. The technique of the deliberate individual feeding test.

PART II:

An outline of the clinical application of one or more of the diagnostic techniques listed in Part I of this presentation. This procedure is especially tailored to meet the needs of the otolaryngologist.

COURSE 490

Room 734 Period Th-3

HERBERT J. RINKEL, M.D.
Kansas City, Mo.
BY INVITATION

The Diagnosis of Inhalant Allergy

PART I:

The Diagnosis of Inhalant Sensitization will be discussed in two parts.

A. History
B. Skin tests

Skin tests will evaluate the use of gradations in sensitivity and a delineation of some possible sources of error in such tests.

PART II:

A practical application of the results of the skin tests in correlation with the clinical picture. Various factors modifying therapy will be discussed in detail.

COURSE 491

Room 743 Period W-2

BERNARD J. RONIS, M.D.
Philadelphia

Chronic Sinusitis: Diagnosis and Treatment

The diagnosis of chronic disease of the paranasal sinuses requires systematic review of the patient's history and clinical findings. The evaluation of the cellular pathology of sinus secretions and biopsy of the mucous membrane offers a means of differentiating subacute, chronic, specific, nonspecific or neoplastic disease. The inflammatory changes in the nose and sinuses exhibit similar basic reactions seen in other organs. The results of medical and surgical treatment can be prognosticated with some degree of accuracy in such disorders as sarcoidosis, chronic infection and benign or malignant sinuses.

Benign pathologic alterations in the sinus epithelium are common and may be extensive, with the resultant metaplasia filling the sinus with papillary or polypoid mucosa.

The medical treatment of chronic sinusitis with those potent agents—the antibiotics, antihistaminics and steroids—is important today.

Surgical measures are necessary less frequently, but they are indicated in certain instances. These indications will be discussed. The type of operation must fit the needs of the individual patient.

In review of this problem the following are considered:

1. Methods of diagnosis
2. Technique of biopsy of sinus mucosa and result of histologic study
3. Adequate medical treatment
4. Indications for operation
5. Choice and techniques of operation
6. End results of sinus operation

COURSE 492

Room 731 Period Th-1

SAMUEL ROSEN, M.D.
New York

Surgical Anatomy of the Vestibule with Reference to the Stapedial Footplate

Fenestration of the oval window through the still rigid footplate after all efforts to mobilize the neck and footplate have been exhausted has restored hearing up to the normal level with complete closure of the air-borne gap. This has occurred whether the ossicular chain is interrupted or not. Hearing improvement in such cases has been maintained for almost three years to date. This phenomenon must now be explained, especially with the help of acoustic physiologists. The material will consist of fenestrated stapes (cadaver) specimens, case studies with audiograms, and a film demonstrating the technique. The surgical anatomy of the vestibule with relation to the stapes will be shown in diagram and models.

COURSE 493

Room 734 Period Th-1

ROBERT E. RYAN, M.D.
St. Louis

Headache: Differential Diagnosis and Treatment

The differential diagnosis and the treatment of various types of headache will be presented. Among types of headache to be discussed are migraine, histaminic cephalalgia, sinusitis, myalgia, tension headache, psychogenic, hypertensive headache, post-traumatic headache, and ocular or otic headache, as well as the mixed type.

Various new preparations for treating headache patients will be discussed and the results of treatment demonstrated. Many of these drugs are still in the investigative stage, while others have been on the market for only a short period of time. The prophylactic and the symptomatic phases of the various types of headache will be discussed.

Techniques for recording the history of the headache patient and for routine examination will be outlined.

COURSE 494

Room 734 Period Th-2

WILLIAM H. SAUNDERS, M.D.
Columbus, Ohio

Oral Lesions: Treatment and Clinical-Pathologic Correlation

Two screens will be used on which to show slides of oral lesions and their corresponding microscopic sections (both in color). This presentation, which permits the audience to view slides of both the actual lesion and its color photomicrograph simultaneously, graphically portrays the clinical lesion and its behavioral characteristics.

Some of the lesions shown represent common oral diseases, the exact nature of which the practicing physician may have forgotten because of unfamiliarity with microscopic pathology. Other lesions represent diagnostic rarities which lend themselves well to clinical-pathologic correlation.

COURSE 495

Room 740 Period W-2

EUGENE W. SCHELDRUP, M.D.
Iowa City
BY INVITATION

Applied Anatomy of the Neck

The anatomy of those regions of the neck that are most commonly invaded surgically by the otolaryngologist will be discussed and visualized through the medium of appropriate lantern slides and chalk sketches. Special attention will be devoted to those few but significant anatomic relationships and landmarks which not only facilitate proper orientation of the surgeon in the various regions discussed but also aid in the prevention of damage to the important neurovascular (and other) structures contained therein. Surgical approaches to the various regions will be emphasized. Practical aspects will keynote the entire discussion.

COURSE 496

Room 744 Period T-3

HAROLD F. SCHUKNECHT, M.D.
Detroit

Graft-Metal Prosthesis Technique for Stapes Substitution in the Mangement of Otosclerosis

The stapes replacement operation, using metal and soft tissue, has been used in several hundred cases. The operative procedure consists of the following steps:

1. Appropriate exposure of the posterior mesotympanum by using the usual transtympanic approach.

2. Disarticulation of the incudostapedial joint and removal of the head, neck and crura of the stapes.

3. Removal of the mucosa from the footplate and from the oval window niche.

4. Removal of a small bit of connective tissue and/or adipose tissue from the ear lobe or postauricular area.

5. Creation of the graft prosthesis.

6. The footplate of the stapes is removed with hooks, chisels and appropriate burrs.

7. The graft prosthesis is introduced, placing the tissue in the oval window and the hook over the incus.

8. The incus hook is tightened to the long process with a special parrot-beak-shaped alligator forceps.

9. The tympanomeatal flap is replaced and a bit of packing placed in the external auditory canal.

COURSE 497

Room 724 Period Th-1

HAROLD F. SCHUKNECHT, M.D.
Detroit

Removal and Preparation of the Human Temporal Bone

The acquisition of fresh human temporal bones continues to be an important adjunct to the training and research activities in departments of otolaryngology. Specimens are needed to show the pathological changes underlying different types of vertigo and deafness.

Temporal bones are also needed as fresh specimens for teaching otologic surgery. Otologic surgery is performed almost entirely with the operating microscope and considerable practice is required to manipulate delicate instruments in this magnified visual field. Such skill can be acquired only by anatomic dissection and surgical exercises on the fresh human temporal bone.

There is an abundant supply of fresh human temporal bones in the autopsy room. After removing the brain with care so as to avoid avulsing the eighth cranial nerve, the temporal bones are removed with either the chisels or the bone plug cutter.

A motion picture and lantern slides will be shown demonstrating the details of the technique for removing the temporal bones, suggestions will be offered how best to preserve them, and information will be provided as to the best techniques for histological preparation of the ears.

COURSE 498

Room 706 Period W-1

LYLE M. SELLERS, M.D.
Dallas

The Office Practice of Otolaryngology

Here are the procedures found by many years' experience to be most effective in the office practice of otolaryngology. The course will begin with the introduction of the patient to proper office procedures by the receptionist. It will continue with methods of keeping records, both professional and business; putting the patient at ease in the presence of strange and perhaps awesome environment; dealing with the patient as a sick and frightened human being; the successful approach to the human and humane handling of children.

Special attention will be given to the technical procedures in the course of treatment that have proved to be of most value in the ordinary as well as in unusual clinical problems. Consideration will also be given to office equipment and how to keep it modern and workable without the extravagant purchases of new gadgets that prove to have little or no value beyond the passing moment. In short, the discussion will be based on how best to conduct yourself and your office that out of your practice will come that which will be of lasting benefit to your patients and to you.

COURSE 499

Room 733 Period Th-2

LYLE M. SELLERS, M.D.
Dallas

Dizziness: Its Cure or Relief

The practical, simple and direct methods for the cure or the relief of dizziness as developed by many years' practice in this field of otology are offered in this course.

Only enough of the anatomy and physiology of the vestibular labyrinth will be given to assure understanding of the clinical tests. The tests themselves, when divested of theoretical adventitia, actually are very easily performed and interpreted.

Because the particular type of dizziness or dysfunction must be identified before successful treatment can be instituted, differential diagnosis will be stressed.

When identification of the cause is accomplished, the proper treatment evolves logically and easily. It is this phase of the problem that will be emphasized by the discussion of actual cases with their problems in diagnosis and successful treatment.

Ample time for questions and answers will be allowed.

COURSE 500

Room 744 Period W-2

BEN H. SENTURIA, M.D.
BENARD C. ADLER, M.D.
St. Louis

Middle Ear Effusions: Pathogenesis and Treatment

The many varieties of effusions in the middle ear have been under investigation. Diagnostic criteria have been submitted to critical evaluation. The chemical, bacteriologic and cytologic properties of the fluid have been reviewed. Allergic factors and radiologic mastoid and sinus findings have been reassessed.

The therapeutic approach has included the development of special instruments for visualization and aspiration of the middle ear fluid. The progress being made with various enzymes to solubilize the protein-carbohydrate complex in the fluid will be presented. Various forms of treatment including the use of indwelling catheters and the indication for antibiotics and antihistamines will be discussed.

COURSE 501

Room 744 Period T-2

GEORGE E. SHAMBAUGH, JR., M.D.
Chicago

Surgical Application of the Mechanics of the Middle Ear

The middle ear is a mechanical device for overcoming the air-water-sound barrier. It does this by sound pressure transformation for the oval window with sound protection for the round window. Each pathologic lesion of the outer and middle ear produces its characteristic pattern of audiometric impairment and each requires a particular surgical technique for the deliberate reconstruction of an effective mechanical device. Surgical techniques for improving the hearing in osteoma of the meatus, fibrous atresia of the meatus, bony atresia of the meatus, various malformations of the ossicular chain, otosclerotic stapes fixation, traumatic interruption of the ossicular chain, and the various types of middle ear changes following suppurative diseases will be described with illustrative case reports and hearing results.

COURSE 502

Room 738 Period T-2
or or
Room 744 Period W-3

JOHN J. SHEA, JR., M.D.
Memphis

Fenestration of the Oval Window

This operation is a combination of the best features of fenestration of the lateral semicircular canal and mobilization of the stapes. It was developed for those cases in which the otosclerotic invasion of the stapes was so extensive that the ordinary methods of mobilization were not effective. When the invasion of the stapes is widespread, then the arch of the stapes is removed and the mucoperiosteum is carefully taken away for a distance of about one milimeter surrounding the oval window. As much of the footplate as possible is then removed, using sharp picks and special stainless steel fistula hooks or a very small cutting burr in the contra-angle handpiece. The fenestra is then covered with a short length of vein graft removed from the back of the hand, with the intima side upward and the adventitia side downward toward the fenestra. The sound conducting mechanism is then rebuilt with a short length of polythylene 90 tubing which is placed between the center of the vein graft and the lower end of the incus.

The results to date with this new operation have been very encouraging.

COURSE 503

Room 727 Period W-2

EMANUEL M. SKOLNIK, M.D.
Chicago

Electrodiagnosis in Facial Nerve Paralysis

The purpose of this course is to discuss in detail electrodiagnostic techniques for the scientific assessment of the status of facial nerve paralysis. The

merits of the faradic-galvanic tests and electromyography relative to the conservative and surgical management of facial paralysis will be presented.

COURSE 504

Room 706 Period Th-3

EMANUEL M. SKOLNIK, M.D.
Chicago

Head and Neck Surgery: Errors and Safeguards

The head and neck area contains a concentration of major anatomic structures unexcelled in the human body insofar as damage to these structures may effect the cosmetic appearance and functional capacities of the individual.

The subject matter will be discussed according to the similar types of tissues in the area (muscles, nerves, vascular structure, etc.) rather than on purely anatomic grounds. Lantern slides will be adequate to demonstrate the various incisions and the contiguous anatomy. The management of complications will be stressed.

COURSE 505

Room 721 Period Th-3

MARTIN SPECTOR, M.D.
Philadelphia

Dizziness: Differential Diagnosis

The history and examination will be approached from the viewpoint of the otologist in his office. Details of the history and examination will be discussed, and their significance stressed. An orderly outline for taking the history will be presented. Steps in the examination will be described. Postural vertigo and nystagmus will be stressed particularly, since they are so often missed. Criteria for consultations, roentgenograms, and laboratory tests will be discussed.

COURSE 506

Room 732 Period W-1

JOSEPH A. SULLIVAN, M.D.
J. BRYDON SMITH, M.D.
KENNETH McASKILE, M.D.
Toronto, Ont., Canada

Facial Palsies and Their Treatment

Recent interest in stapes mobilization, tympanoplasty and myringoplasty has forced the otologist to adopt magnification in order to carry out these procedures.

It is hoped that such magnification will reduce the number of postoperative facial palsies. However, despite all precautions, accidents can and do happen. This course is designed to advise the otologist when and how to decompress the facial nerve and the correct method of doing so. The variations of facial nerve repair and their end results will be discussed.

COURSE 507

Room 712 Period T-1
or or
Room 724 Period W-1

HAROLD G. TABB, M.D.
New Orleans

Closure of Tympanic Membrane Perforations with Vein Grafts

Several methods of closing tympanic membrane perforations with autogenous vein grafts will be presented in this course. Vein grafts, which were first introduced in ear surgery by Shea, have been found to produce a high percentage of successful closures in eardrum perforations and, in the author's opinion, are superior to skin for this purpose.

Lantern slides and motion pictures will be used to demonstrate detailed technique.

COURSE 508

Room 743 Period T-1

NICHOLAS TOROK, M.D.
Chicago

Clinical Nystagmography

The vestibular examination is one half of the task when the function of the ear has to be evaluated. The most reliable audiogram alone is often insufficient when the function of the ear is to be analyzed. Testing of hearing has come a long way from the time of complete dependence on tuning forks and the whispered voice. Vestibular testing methods remained unaltered for almost a half century. Objective recording of the nystagmus and graphic representation of the vestibular activity may be compared to the introduction of the audiometer in hearing measurement. Nystagmography today is a simple procedure applicable to the clinic or the office. For the last ten years, since nystagmus has been recorded more and more widely, new vistas have been opened for the study of vestibular physiology and pathology.

The simple technique of nystagmography and the application and significance of its use in practice will be demonstrated and discussed.

COURSE 509

Room 732 Period Th-2

O. E. VAN ALYEA, M.D.
Chicago

Sinusitis: Modern Trends in Management

Persistence of a sinus infection implies inadequate drainage. Factors contributing to impairment of drainage may be local or systemic. The local factors may be structural or pathologic, and in some cases the sinusitis is maintained by a combination of contributing causes.

The goal of the rhinologist is to eliminate the causative factors while treating the infection.

Seldom is the radical removal of sinus mucosa in the treatment of sinusitis indicated, and it should be undertaken with the understanding that only temporary relief may be expected and that a return of the symptoms, even more pronounced than formerly, may ensue.

In this course the techniques of various therapeutic measures used successfully in the management of sinus disease will be discussed in detail.

COURSE 510

Room 724 Period T-2

HANS von LEDEN, M.D.
and
PAUL MOORE, Ph.D.
BY INVITATION
Chicago

Current Trends in Office Laryngology

Most patients consult the laryngologist for one of two reasons: throat pain or hoarseness. For many years organic lesions of the larynx have monopolized the interest of the laryngologist, but the current emphasis on communcations directs our attention to the far more common cases of functional hoarseness.

In this course we will stress laryngeal disorders which are the result of faulty vocal use. The diagnosis of these disorders will be presented with emphasis on new additions to office equipment, such as the electronic laryngostroboscope. The role of the physician in the management or supervision of vocal rehabilitation will be discussed.

COURSE 511

Room 706 Period T-1

LINDEN J. WALLNER, M.D.
Chicago

Diseases of the Larynx: Kodachrome Clinic

The diagnosis of diseases of the larynx will be stressed. Kodachrome slides will be used to portray the common laryngeal conditions and a group of unusual ones. Included will be acute and chronic inflammation, and tuberculosis before and after antimicrobial therapy. There will be representative examples of cysts, singer's nodes, contact ulcer, granuloma following endotracheal tubes, "smoker's larynx," foreign bodies and benign and malignant tumors. In a number of instances the appearance before and after treatment will be shown.

COURSE 512

Room 728 Period W-1

LINDEN J. WALLNER, M.D.
Chicago

Diseases of the Nasopharynx: Kodachrome Clinic

Visualization of the nasopharynx should be routine on all patients. The rewards compensate for the time and effort required. Methods of accomplishing this and of taking biopsies will be discussed. Kodachrome slides will be used to depict the appearance of the normal nasopharynx as well as a variety of diseases. Examples of mulberry hypertrophy of the turbinates, hypertrophy of the posterior border of the septum, adenoid, cysts, choanal polyps, congenital atresia before and after operation, and a variety of benign and malignant tumors will be included.

COURSE 513

Room 733 Period W-2

DeGRAAF WOODMAN, M.D.
New York

Vocal Cord Survey

Techniques for the correction of the obstructed glottic airway caused by laryngeal paralysis secondary to the complications of thyroid surgery as well as bulbar and peripheral types of paralysis will be presented.

The use of keels and acrylic molds for the correction of webs and glottic stenosis will be demonstrated.

Voice rehabilitation through surgical therapy combined with speech therapy will be shown.

All techniques will be demonstrated with the aid of color motion pictures with sound and slides.

HOME STUDY COURSES

Since the Home Study Courses were established in 1940 more than 8000 physicians have utilized them in preparing for practice, teaching, or research in the fields of ophthalmology and otolaryngology.

The value of the Courses as a supplement to available curricular training appertaining to the two specialties is widely recognized, and they are now a routine part of most postgraduate training programs.

The 1960-1961 Courses will begin September 1, and registrations should be completed before August 15. Detailed information and application forms may be secured from Dr. William L. Benedict, Executive Secretary-Treasurer of the Academy, 15 Second Street S.W., Rochester, Minnesota. The fee is $20.00.

The Following are Condensed Schedules of Courses Previously Described

CONTINUOUS COURSES — OPHTHALMOLOGY

COURSE NO.	SPEAKER	SUBJECT	PERIODS
1	**Allen et al.**	Bacteriology & Infectious Diseases	8 PERIODS M-4, M-5, T-4, T-5 W-4, W-5, Th-4, Th-5
2	**Ascher**	Aqueous Veins in Glaucoma	2 PERIODS M-4, M-5
3	**Ballintine & Purnell**	Clinical Tonography	2 PERIODS W-5, W-6
4	**Becker & Kinsey**	Studies of Aqueous Flow	2 PERIODS T-4, T-5
5	**Bedell**	Ophthalmoscopy	3 PERIODS M-4, T-4, W-4
6	**Berliner**	Recent Advances in Biomicroscopy	3 PERIODS M-6, T-6, W-6
7	**Boeder**	Practical Optics	2 PERIODS Th-4, Th-5
8	**Braley**	Fundus Lesions	2 PERIODS W-5, W-6
9	**Brockhurst & Regan, C.**	Indirect Ophthalmoscopy	3 PERIODS M-4, M-5 and choice of T-4, T-5, T-6
10	**Brown et al.**	Eye Muscles	8 PERIODS M-4, M-5, T-4, T-5 W-4, W-5, Th-4, Th-5
11	**Byrnes**	Ophthalmic Filters	2 PERIODS T-5, T-6
12	**Callahan et al.**	Ophthalmic Plastic Surgery: Advanced	8 PERIODS M-5, M-6, T-5, T-6 W-5, W-6, Th-5, Th-6
13	**Clark, G.**	Retinal Detachment	3 PERIODS M-6, T-6, W-6
14	**Constantine et al.**	Contact Lenses	6 PERIODS T-4, T-5, W-4, W-5 Th-4, Th-5
15 or 16	**Copeland**	Streak Retinoscopy	4 PERIODS M-4, M-5, T-4, T-5 or W-4, W-5, Th-4, Th-5
17	**Costenbader et al.**	Orthoptics for the Practicing Ophthalmologist	3 PERIODS M-4, M-5, M-6
18	**Fonda & Sloan**	Subnormal Vision	2 PERIODS T-4, T-5
19	**Gibbons & Cunningham**	Educational Management of Partially Seeing Children	2 PERIODS T-4, T-5
20	**Gibson et al.**	Surgery of Heterotropia	4 PERIODS W-5, W-6, Th-4, Th-5
21	**Hughes et al.**	Ophthalmic Plastic Surgery: Fundamentals	8 PERIODS M4, M-5, T-4, T-5 W-4, W-5, Th-4, Th-5
22	**Iliff et al.**	Ptosis	3 PERIODS W-4, W-5, W-6
23	**Jardon & Laubheimer**	Fitting Ocular Prostheses	2 PERIODS W-4, W-5
24	**Knighton et al.**	Practical Essentials of Glaucoma	9 PERIODS M-4, M-5, M-6 T-4, T-5, T-6 W-4, W-5, W-6

CONTINUOUS COURSES — OPHTHALMOLOGY

COURSE NO.	SPEAKER	SUBJECT	PERIODS
25	**Leinfelder et al.**	Diagnostic Aids in Neuro-ophthalmology	3 PERIODS Th-4, Th-5, Th-6
26	**Lemoine et al.**	Fundus Lesions	3 PERIODS M-4, M-5, M-6
27	**Linksz**	Physiology of Vision	2 PERIODS M-4, M-5
28	**Lloyd**	Diseases of the Cornea	2 PERIODS M-4, M-5
29	**Masters, R., et al.**	Slit Lamp Biomicroscopy: Fundamentals	9 PERIODS M-4, M-5, M-6 T-4, T-5, T-6 W-4, W-5, W-6
30	**McLean et al.**	Practical Factors in Eye Surgery	4 PERIODS M-4, M-5, T-4, T-5
31	**Mullen et al.**	Ocular Emergencies	3 PERIODS M-4, M-5, M-6
32	**Parks & Albert**	Eso-Deviations	4 PERIODS W-5, W-6, Th-4, Th-5
33	**Pierce et al.**	Retinal Detachment: Basic Course	6 PERIODS M-4, M-5, T-4, T-5 W-4, W-5
34	**Pischel et al.**	Retinal Detachment	4 PERIODS M-4, M-5, T-4, T-5
35	**Posner & Gorin**	Office Gonioscopy	2 PERIODS T-4, T-5
36	**Prewitt**	Diagnosis & Treatment of Ocular Allergy	2 PERIODS W-5, W-6
37	**Roberts**	Glaucoma	2 PERIODS M-4, M-5
38	**Rolett**	Gonioscopy	2 PERIODS W-4, W-5
39	**Romaine**	Ocular Motility Surgery	4 PERIODS M-4, M-5, T-4, T-5
40	**Romaine**	Refraction Problems & Treatment	3 PERIODS M-6, T-6, W-6
41	**Ruedemann & Noell**	Clinical Electroretinography	2 PERIODS W-5, W-6
42	**Schepens**	Recent Advances in Retinal Detachment	3 PERIODS Th-4, Th-5, Th-6
43	**Schimek & Bousquet**	Clinical Gonioscopy & Tonography	2 PERIODS Th-4, Th-5
44	**Schlaegel & Hungerford**	Uveitis	2 PERIODS Th-4, Th-5
45	**Sloane**	School Vision Testing	2 PERIODS M-4, M-5
46	**Sloane**	Telescopic Lenses	2 PERIODS T-4, T-5
47	**Gettes**	A. Prescription of Prisms B. Drugs in Refraction	2 PERIODS W-4, W-5
48	**Stow & Moss**	Diagnostic & Therapeutic Office Procedures	2 PERIODS M-5, M-6
49	**Theobald et al.**	Histopathology	12 PERIODS M-4, M-5, M-6, T-4 T-5, T-6, W-4, W-5 W-6, Th-4, Th-5, Th-6

CONTINUOUS COURSES — OPHTHALMOLOGY

COURSE NO.	SPEAKER	SUBJECT	PERIODS
50	Thorpe & Berman	Intraocular Foreign Bodies	2 PERIODS W-4, W-5
51	Thorpe et al.	Advances in Slit Lamp Biomicroscopy & Applanation Tonometry	3 PERIODS Th-4, Th-5, Th-6
52	Thorpe & Allen, L.	Slit Lamp Gonioscopy	6 PERIODS M-4, M-5, M-6 T-4, T-5, T-6
53	Townes	Cataract Surgery	2 PERIODS Th-4, Th-5
54	Troutman et al.	Recent Advances in Ophthalmology	8 PERIODS M-5, M-6, T-5, T-6 W-5, W-6, Th-5, Th-6
55	Troutman	Enucleation Surgery	2 PERIODS T-5, T-6
56	Wise	Retinal Diseases	2 PERIODS Th-4, Th-5
57	Home Study Discussion Periods		10 PERIODS M-4, M-5, M-6, T-4 T-5, T-6, W-4, W-5 W-6, Th-4

SCHEDULE OF INDIVIDUAL COURSES—OPHTHALMOLOGY—Monday

Key M-4 — 2:00 p.m. to 3:00 p.m.

Course No.	SPEAKER	SUBJECT
104	Alvis	Glaucoma Surgery
123	Calhoun	Epithelization of the Anterior Chamber
126	Cassady	Toxoplasmic Retinochoroiditis
129	Chamberlain	Surgery of the Ocular Muscles
145	DeVoe	Surgery of Trauma
147	Diskan	Eye Screening in Schools
155	Everett	Retinal Detachment
158	Fernandez	Beta Radiation in Pterygium Surgery
163	Frayer	Retained Lens Protein After Operation & Trauma
198	Leopold & Apt	Chemotherapy
206	MacLean	Cataracts
227	Pfeiffer & Jones	Roentgenography of Eye & Orbit
233	Regan, E.	Cataract Surgery
241	Scarney	Slit Lamp Biomicroscopy
262	Veirs	External Dacryocystorhinostomy & Corrective Proceduces for Epiphora

Key M-5 — 3:15 p.m. to 4:15 p.m.

Course No.	SPEAKER	SUBJECT
102	Aldrich	Emotional Problems
109	Bahn	Orbital Disease
133	Cleasby	Iris Tumors
144	Day	Medical Exophthalmos
148	Duke	Lesions of the Lids
149	Dunlap	Divergence Anomalies
154	Ellis	Removal of Intraocular Foreign Bodies
159	Ferrer	Contact Lenses
169	Gipner	Recent Advances in Ophthalmic Surgery
237	Rundles	Streak Retinoscopy
244	Schlossman	Pleoptics
245	Schmidt	Applanation Tonometry
248	Simpson	Hemorrhage into the Vitreous
253	Spaeth, P., & Carmichael	Ocular Tumors

Key M-6 — 4:30 p.m. to 5:30 p.m.

Course No.	SPEAKER	SUBJECT
103	Allen, H.	Aseptic Technique in Ophthalmology
113	Berens	Cyclodiathermy, Cycloelectrolysis, Iridencleisis & Cyclodialysis
122	Buxton	Total & Partial Keratectomies
124	Carroll	Optic Nerve Lesions
131	Cholst	Central Fields
136	Coston	Inflammatory & Degenerative Disease of Retina
138	Cunningham	Types of Head Pain
141	Daily	Biomicroscopy of Vitreous & Fundus Oculi
160	Fink, W.	Binocular Problems in Routine Refraction
168	Gifford	Local Anesthesia with Special Reference to Deep Motor Block
170	Haik	Mechanics of Intracapsular Extraction
173	Henderson	Intracranial Arterial Aneurysms
175	Hunt	Problems in Accommodation
176	Jacobson	Clinical Electroretinography
190	Kornzweig	Clinical Embryology
193	Kronfeld	Medical Management of Eye Lesions Resulting in Increased Pressure
207	Mangold	Proper Fitting of Glasses
226	Perera	Retinal Detachment
238	Rychener	The Lacrimal Apparatus
242	Schele	Congenital Glaucoma
257	Theodore	Ocular Therapeutics
264	Weisser	Repair of Corneal Injuries
265	Wendland	Magnetic Intraocular Foreign Bodies

SCHEDULE OF INDIVIDUAL COURSES—OPHTHALMOLOGY—Tuesday

Key T-4 — 2:00 p.m. to 3:00 p.m.

Course No.	SPEAKER	SUBJECT
105	Andrew	Eye Diseases in Children
108	Atkinson	Anesthesia
114	Berens	Ophthalmic Surgery
121-A	Buessler	Ophthalmic Radiology
123	Calhoun	Epithelization of the Anterior Chamber
125	Cassady	Dacryocystitis & Lacrimal Drainage
140	Cutler	Cataract
153	Egan	Cross Cylinder
164	Fread	Ideal Refraction Equipment
195	Leinfelder	Perimetry & Use of the Tangent Screen
199	Lepard	Eye Diseases Common to Children
209	Mann, W.	Interpretation of Functional Changes in Vision
218	Naquin	Dislocation of the Lens
236	Ruedemann	The Differential Diagnosis & Surgical Correction of Vertical Muscle Defects
250	Smith, J. L.	Neuro-ophthalmology
252	Spaeth, E.	Complicated Ptosis
266	Wood	Macular Lesions
267	Young & Dixon	Contact Lenses

Key T-5 — 3:15 p.m. to 4:15 p.m.

Course No.	SPEAKER	SUBJECT
111	Bannon	Aniseikonia
115	Bettman	Value of Goniotomy
128	Chamberlain	Vertical & Horizontal Components of Strabismus
143	Davis	Sutures in Cataract Surgery
149	Dunlap	Divergence Anomalies
157	Falls	Clinical Manifestations of Constitutional Syndromes Involving Head & Neck
166	Gartner	Fundus Diseases
186	Kennedy	Ocular Manifestations of Systemic Diseases
191	Kronenberg	Practical Ocular Therapeutics
197	Leopold	Advances in Ophthalmic Therapy
224	Paton	Corneal Transplantation
228	Pico	Dacryocystorhinostomy
243	Scheie	Penetrating Injuries of the Globe
249	Smith, B.	Fractures of the Orbit
260	Uihlein	Neuralgias of the Head

Key T-6 — 4:30 p.m. to 5:30 p.m.

Course No.	SPEAKER	SUBJECT
134	Coles	Office Management of Uveitis
141	Daily	Biomicroscopy of Vitreous & Fundus Oculi
146	DeVoe	Acute Surgical Lesions
161	Fink, W.	Vertical Muscle Surgery
165	Fry	Inflammatory & Degenerative Lesions at Posterior Pole of Eye
167	Gemeroy	External Diseases
169	Gipner	Recent Advances in Ophthalmic Surgery
180	Johnson, C. C.	Ptosis
189	Klien	Clinical Pathology of the Retina
200	Levy	Practical Uses of Contact Lenses
204	Long	Retinoblastoma & the Pseudoretinoblastomas
205	Lubkin	Psychosomatic Aspects of Ophthalmology
212	McCannel	Efficiency in the Office
213	McGraw	Contact Lenses
215	Merriam	Radiotherapy in Ophthalmology
216	Morrison	Glaucoma
232	Reese	Cataract Extraction
239	Salleras	Corneal Surgery
240	Sarrail	Plastic Lid Surgery
241	Scarney	Slit Lamp Biomicroscopy
246	Shipman	Scleral Resection
254	Sutliff	Practical Fitting of Corneal Lenses
259	Truhlsen	Home Orthoptics

SECTION ON INSTRUCTION

ADVANCE ORDER SHEET

All courses cost $2.00 for each period (one hour). Follow instructions explicitly and check for errors in listing before mailing.

Orders will not be accepted for presale after September 29. To ensure acceptance they should be mailed before September 27 to

WILLIAM L. BENEDICT, M.D., *Executive Secretary-Treasurer*
American Academy of Ophthalmology and Otolaryngology
15 Second Street S.W., Rochester, Minnesota

Academy Candidates and Guests May Purchase Tickets ONLY at Instruction Desk in Registration Foyer

(Over)

ADVANCE ORDER SHEET

ORDERS FILLED ONLY IF CURRENT DUES ARE PAID

NO REFUNDS WILL BE MADE AFTER OCTOBER 7

(Type or Print) Last Name First Name Middle Initial

Office Address

City Zone State

Days to be Present

- ☐ Monday
- ☐ Tuesday
- ☐ Wednesday
- ☐ Thursday

Total Amount Enclosed $_____

SELECTION OF COURSES ON REVERSE SIDE OF THIS BLANK

RECAPITULATION OF GENERAL INSTRUCTIONS

1. Monday, Tuesday, Wednesday, and Thursday are represented by the letters M, T, W, Th. The first period in the morning is represented by figure 1, second period by figure 2 and third period by figure 3. The first period in the afternoon is represented by figure 4, second period by figure 5, and third period by figure 6. All courses in otolaryngology and maxillofacial surgery are presented in the mornings. All courses in ophthalmology are presented in the afternoons.

2. Reservation of instruction tickets in advance of the meeting will be made ONLY for MEMBERS whose 1960 dues have been paid. ACADEMY CANDIDATES AND GUESTS MAY MAKE SELECTION OF COURSES *ONLY* AT THE GENERAL REGISTRATION DESK IN CHICAGO.

3. Make check payable to W. L. Benedict, M.D.

4. Mail order promptly to ensure reservation of first choices. If necessary, an attempt will be made to rearrange schedule to include "first choices."

(Over)

SELECTION OF COURSES

PERIOD		FIRST CHOICE		SECOND CHOICE		THIRD CHOICE	
		Course No.	Lecturer	Course No.	Lecturer	Course No.	Lecturer
MON.	4						
P.M.	5						
	6						
TUES.	1						
A.M.	2						
	3						
P.M.	4						
	5						
	6						
WED.	1						
A.M.	2						
	3						
P.M.	4						
	5						
	6						
THURS.	1						
A.M.	2						
	3						
P.M.	4						
	5						
	6						

SCHEDULE OF INDIVIDUAL COURSES—OPHTHALMOLOGY—Wednesday

Key W-4 — 2:00 p.m. to 3:00 p.m.

Course No.	SPEAKER	SUBJECT
101	Aebli	End Results in Muscle Surgery
106	Asbury	Practical Genetics in Everyday Office Practice
120	Breakey	Rehabilitation in Ophthalmology
121	Breinin	Electromyography
125	Cassady	Dacryocystitis & Lacrimal Drainage
127	Castroviejo	Corneal Surgery
139	Cusick	Ptosis Surgery
145	DeVoe	Surgery of Trauma
150	Dunlap	Accommodative Esotropia
162	Fox	Senile Ectropion & Entropion
172	Hedges	Neralgias of the Head
177	Jaeckle	Nonstrabismic Abnormalities of Binocular Vision
179	Jobe	Ophthalmic Instruments
185	Kearns	Unusual Neurologic Motor Anomalies
187	King	Lamellar Corneal Transplantation
195	Leinfelder	Perimetry & Use of the Tangent Screen
203	Lloyd	Fundus Lesions of the Senile Eye
208	Mann, M.	Vascular Changes in the Fundus
242	Schele	Congenital Glaucoma
251	Spaeth, E.	Plastic Surgery
263	Weingeist	Lacrimal Sac Surgery

Key W-5 — 3:15 p.m. to 4:15 p.m.

Course No.	SPEAKER	SUBJECT
110	Bannon	Practical Aspects of Multifocal Corrections
112	Belmont	Refraction
119	Brav	Diseases of the Choroid
130	Chamlin	Perimetry
151	Dunnington	Cataract Extraction
156	Falls	Ocular Geriatrics
183	Katz, D.	Ophthalmic Anatomy
194	Leahey	Corneal Transplantation
196	Lennon	Angle Closure Glaucoma
213	McGraw	Contact Lenses
214	McGuire	Cataract
225	Paulson	Lighting for Comfortable & Accurate Seeing
229	Pischel	Problems with Light Therapy
231	Potts	Retinotoxic Substances
234	Rizzuti	Tumors of Lids & Ocular Adnexa

Key W-6 — 4:30 p.m. to 5:30 p.m.

Course No.	SPEAKER	SUBJECT
107	Ascher	Cyclodialysis
116	Bettman	Radioactive Isotopes
135	Cordes	Congenital Cataract
171	Halberg	Tear Formation
178	Jampolsky	Ocular Divergence
181	Joy	Chronic Glaucoma
182	Kasper	Dacryocystorhinostomy
184	Katz, I.	Common Eye Diseases of Dogs & Their Therapy
191	Kronenberg	Practical Ocular Therapeutics
192	Kronfeld	Present Trends in Ocular Pharmacology
201	Lewis	Practical Use of Mechanical Visual Aids in the Poor Sighted
211	Marshall	Differential Diagnosis & Treatment of Infections of Lids
217	Murrah	Subnormal Vision
219	Newell	Radioactive Isotopes
221	Ogle	Stereopsis
235	Rubin	Aims in Management of Squint
247	Simonton	Orbital Surgery
255	Tait	Heterophoric Asthenopia
256	Tassman	Eye Involvement in Systemic Diseases
258	Trent	Progress in Ophthalmology
260	Uihlein	Neuralgias of the Head
261	Vail	Senile Cataract

SCHEDULE OF INDIVIDUAL COURSES—OPHTHALMOLOGY—Thursday

Key Th-4 — 2:00 p.m. to 3:00 p.m.

Course No.	SPEAKER	SUBJECT
117	**Block**	Office Practice of Ophthalmology
118	**Bonaccolto**	Dacryocystorhinostomy
132	**Clark, W.**	Surgery of Ocular Muscles
137	**Cowen**	Pool Gonioscopy
142	**Davidson**	Surgical Instruments
152	**Edwards**	Abnormal Effects of Prescribed Lenses on Extrinsic Muscles
174	**Hill, H.**	Cataract Surgery
188	**King**	Transplantation of Preserved Ocular Tissues
202	**Linn**	Evaluation of Patient for Surgery in Open Angle Glaucoma
210	**Marks**	Electrical Currents Used in Ophthalmology
220	**Newell**	Refinements in Ophthalmic Surgery
222	**Ogle**	Binocular Oculomotor Coordination & Imbalances
223	**Olson**	Iritis, Iridocyclitis, Keratitis
230	**Post**	Refinements of Refraction

CONTINUOUS COURSES AND PANEL DISCUSSIONS
OTOLARYNGOLOGY

COURSE NO.	SPEAKER	SUBJECT	PERIODS
301	Anderson	Rhinoplasty	2 PERIODS T-1, T-2
302	Baron	Tympanoplastic Procedures	2 PERIODS Th-1, Th-2
303	Brewer & Briess	Head & Neck Symptoms Associated with Laryngeal Microtrauma	2 PERIODS Th-1, Th-2
304 or 305	Conley & Lenz	Carcinoma of Head & Neck	2 PERIODS T-1, T-2 or W-1, W-2
306	Converse	Principles of Nasal Plastic Surgery—Basic	2 PERIODS T-2, T-3
307	Converse	Principles of Nasal Plastic Surgery—Advanced	2 PERIODS Th-2, Th-3
308	Fox & Glorig	Noise in Industry	2 PERIODS T-2, T-3
309	Godlowski	I. Physiopathology of Endocrine System II. Enzymatic Mechanism of Allergy	2 PERIODS T-2, T-3
310	Godlowski	Endocrinopathies	2 PERIODS Th-2, Th-3
311	Guilford & Wright	Techniques of Tympanoplasty	2 PERIODS W-1, W-2
312	Hansel	Allergy & Medical Otolaryngology	2 PERIODS T-2, T-3
313	Harbert	Clinical Audiology	2 PERIODS T-1, T-2
314	Hardy & Pauls	Clinical Audiology for Children	2 PERIODS W-2, W-3
315	House, H., & House, W.	Reconstructive Surgery for Chronic Ear Disease	2 PERIODS W-1, W-2
316	Johnston et al.	Emergencies in Otolaryngology	2 PERIODS W-1, W-2
317	Kazanjian et al.	Traumatic Injuries of the Face	2 PERIODS W-2, W-3
318	Lathrop et al.	Your Otological Problems	2 PERIODS Th-2, Th-3
319	Lawrence	Acoustic Principles in Middle Ear Surgery	2 PERIODS W-2, W-3
320 or 321	Lindsay	Deafness & Dizziness of Vascular Origin	2 PERIODS T-2, T-3 or W-2, W-3
322	Simonton et al.	What the Otologist Should Know About Hearing Aids	2 PERIODS Th-2, Th-3
323	Sisson et al.	Team Judgment in the Management of Head & Neck Cancer	2 PERIODS T-2, T-3
324	Walsh	What Can Be Done for Deafness	2 PERIODS Th-1, Th-2

SCHEDULE OF INDIVIDUAL COURSES—OTOLARYNGOLOGY—Tuesday

Key T-1 — 9:00 a.m. to 10:00 a.m.

Course No.	SPEAKER	SUBJECT
401	Alexander	The Adenoid Problem
412	Bordley	Deafness in the Infant and Preschool Child
418	Compere	Radiologic Examination of Mastoid, Middle Ear & Eustachian Tube
420	Daly & Cardona	Corrosive Esophagitis
422	DeWeese	The Problem of the Dizzy Patient
425	Farrior, J. B.	Tympanoplasty in 3-D
429	Fishbein	Medical Writing
433	Furstenberg	Management of Nasal Obstruction
437	Goodhill & Brockman	The Articulated Prosthesis in Stapes Surgery
441	Guilford & Wright	Controlled Healing of Tympanoplasty & Mastoid Cavities
447	Hilsinger	Vascular Headaches
458	Kos	Vein Plug Stapedioplasty
466	Loch	Septum Deviations
467	Lore	Vascular Surgery in Head & Neck
470	McHugh	Traumatic Conductive Deafness & Facial Paralysis
471	McLaurin & Raggio	The Child Without Speech
507	Tabb	Closure of Tympanic Membrane Perforations with Vein Grafts
508	Torok	Clinical Nystagmography
511	Wallner	Diseases of the Larynx

Key T-2 — 10:15 a.m. to 11:15 a.m.

Course No.	SPEAKER	SUBJECT
426	Farrior, J. B.	Stapes Operations—1960
431	Fitz-Hugh & McLean	Cancer of the Nasal Accessory Sinuses
432	Fowler	Facial Paralysis
438	Gorney	Septum Surgery in the Twisted Nose
443	Hallberg	Severe Nosebleed
453	Jordan, L.	Recent Nasal Fractures
462	Lepper	Antibiotics in Otolaryngology
478	Pastore	The Throat: Nonsurgical Problems
479	Pearlman, S.	Certain Aspects of Aging in Ear, Nose & Throat Regions
487	Reed	Neck Dissection
501	Shambaugh	Surgical Application of the Mechanics of the Middle Ear
502	Shea	Fenestration of the Oval Window
510	von Leden & Moore	Current Trends in Office Laryngology

Key T-3 — 11:30 a.m. to 12:30 p.m.

Course No.	SPEAKER	SUBJECT
403	Altmann & Waltner	Treatment of Meniere's Disease with Ultrasonic Waves
404	Anson & Rea	Stapediovestibular Anatomy in Relation to the Problems of Stapes Surgery
411	Bolotow	Rhinoplasty
421	Devine	Total Laryngectomy
439	Grandon	Plastic Surgical Procedures
445	Harkins	Routine Office Management of Allergic Patients
454	Jordan, R.	Meniere's Disease
455	Juers	Perforations & Hearing Conservation Surgery
461	Lemon	Serous Otitis Media in Children
473	Myers	The Microsurgery of Otosclerosis
475	Neivert	Intranasal Ethmoidectomy
482	Proctor	Tympanoplasty
489	Rinkel	The Diagnosis of Food Allergy
496	Schuknecht	Graft-Metal Prosthesis Technique for Stapes Substitution in the Management of Otosclerosis

SCHEDULE OF INDIVIDUAL COURSES—OTOLARYNGOLOGY—Wednesday

Key W-1 — 9:00 a.m. to 10:00 a.m.

Course No.	SPEAKER	SUBJECT
402	Alfaro	Fullness in the Ear
405	Armstrong	Use of Vinyl Tubing in the Treatment of Chronic Secretory Otitis Media
413	Bradley	Practical Office Speech Audiometry
415	Ciell	Hypnosis in Otolaryngology
422	DeWeese	The Problem of the Dizzy Patient
427	Farrior, R.	A Method of Otoplasty
435	Goldman, I.	Correction of the Deviated Nose
436	Goldman, J.	Nasal Disorders
452	Jones	External Otitis
458	Kos	Vein Plug Stapedioplasty
474	Myers & Schlosser	Surgery of Chronic Otitis Media & Mastoiditis
486	Rawlins	The Corticosteroids in Otolaryngology
488	Reger	Practical Office Audiometry
498	Sellers	The Office Practice of Otolaryngology
506	Sullivan et al.	Facial Palsies & Their Treatment
507	Tabb	Closure of Tympanic Membrane Perforations with Vein Grafts
512	Wallner	Diseases of the Nasopharynx

Key W-2 — 10:15 a.m. to 11:15 a.m.

Course No.	SPEAKER	SUBJECT
410	Bellucci	Surgery of the Stapes & Oval Window
414	Brodnitz	Actor & Singer as Patients of the Otolaryngologist
444	Hallberg	Sudden Deafness
457	Kirchner	Facial Bone Injuries
459	Kraus & Furey	Adventures in Space
464	Lewis, P.	Reactions to Drugs & Antibiotics
465	Lewy	Direct Laryngoscopy
468	Magielski	Neurogenic Tumors of Head & Neck
480	Perlman, H.	Fluid in the Middle Ear
491	Ronis	Chronic Sinusitis
495	Scheldrup	Applied Anatomy of the Neck
500	Senturia & Adler	Middle Ear Effusions
503	Skolnik	Electrodiagnosis in Facial Nerve Paralysis
513	Woodman	Vocal Cord Surgery

Key W-3 — 11:30 a.m. to 12:30 p.m.

Course No.	SPEAKER	SUBJECT
404	Anson & Rea	Stapediovestibular Anatomy in Relation to the Problems of Stapes Surgery
406	Arnold	Radiographic Diagnosis of Temporal Bone Lesions
409	Bell	Correction of Outstanding Ears
416	Cocke	Salivary Gland Tumors
417	Cody	Eustachian Tube
419	Corgill	Radical Hypopharyngeal Surgery Combined with Neck Dissection
424	Erich	Fractures of the Facial Bones
430	Fitz-Hugh & McLean	Salivary Glands
440	Guggenheim	Technique & Pitfalls of Adenoidectomy
455	Juers	Perforations & Hearing Conservation Surgery
456	Kemler	Diagnostic & Therapeutic Aids in ENT Practice
460	Lederer	Diagnostic & Therapeutic Pitfalls in ENT Practice
469	McBean	Secretory Otitis Media in Children
476	Ogura & Som	Conservation of Laryngeal Function in Cancer of the Larynx
481	Petryshyn	The Fractured Mandible
482	Proctor	Tympanoplasty
502	Shea	Fenestration of the Oval Window

SCHEDULE OF INDIVIDUAL COURSES—OTOLARYNGOLOGY—Thursday

Key Th-1 — 9:00 a.m. to 10:00 a.m.

Course No.	SPEAKER	SUBJECT
402	Alfaro	Fullness in the Ear
407	Atkins	Bronchoscopic Problems of Infancy & Childhood
415	Ciell	Hypnosis in Otolaryngology
424	Erich	Fractures of the Facial Bones
435	Goldman, I.	Correction of the Deviated Nose
437	Goodhill & Brockman	The Articulated Prosthesis in Stapes Surgery
441	Guilford & Wright	Controlled Healing of Tympanoplasty & Mastoid Cavities
448	Hough	Anatomic Variations in the Middle Ear
452	Jones	External Otitis
466	Loch	Septum Deviations
472	Missal	The Cervico-occipital Syndrome
484	Proud	Middle Ear Effusion
492	Rosen	Surgical Anatomy of the Vestibule with Reference to the Stapedial Footplate
493	Ryan	Headache
497	Schuknecht	Removal & Preparation of the Human Temporal Bone

Key Th-2 — 10:15 a.m. to 11:15 a.m.

Course No.	SPEAKER	SUBJECT
408	Becker	Plastic Surgery of Protruding Ears
410	Bellucci	Surgery of the Stapes & Oval Window
414-A	Carhart	Auditory Tests in Diagnosis
423	Dickinson	Saddle Nose
434	Glorig	The Otolaryngologist & Hearing Aid Selection
446	Hilger	Office Diagnostic Methods & Treatments
463	Lewis, J.	Surgery for Advanced Ear Cancer
483	Proctor	Surgical Anatomy of the Temporal Bone
494	Saunders	Oral Lesions
499	Sellers	Dizziness
509	Van Alyea	Sinusitis

Key Th-3 — 11:30 a.m. to 12:30 p.m.

Course No.	SPEAKER	SUBJECT
409	Bell	Correction of Outstanding Ears
428	Farrior, R.	Cancer of Head & Neck
442	Guilford & Wright	Stapes Mobilization Techniques
449	House, H.	Stapes Mobilization Procedure
451	Johnson, F.	Tonsillectomy & Adenoidectomy
460	Lederer	Diagnostic & Therapeutic Pitfalls in ENT Practice
469	McBean	Secretory Otitis Media in Children
477	Ogura	Radical Neck Dissection & Laryngeal Carcinoma
485	Rabbett	Submucous Resection of the Nasal Septum
490	Rinkel	The Diagnosis of Inhalant Allergy
504	Skolnik	Head & Neck Surgery
505	Spector	Dizziness

BOOK REVIEWS

PHYSIOLOGY OF THE RETINA AND THE VISUAL PATHWAY. By G. S. Brindley, M.D., London, England, Edward Arnold Ltd., distributed by Williams & Wilkins, Baltimore. Board cover. 252 pp. with graphs, diagrams and figures. $7.50.

This is a technical dissertation on the physiology of the anterior portion of the visual pathway beginning with the photochemistry of the retina. It continues with the electrical activity of the retina, the retinogram and other studies. The first three chapters describe what can be learned of the retina and visual pathways from purely objective experiments of the kind familiar in the non-sensory branches of physiology. The last four chapters consider the results of sensory experiments; that is, experiments in which an essential part of the result is the report by a human subject of his own sensations. Much of it is consideration of the validity of published conclusions from experimentation which in the opinion of the author is not invariably justified. This is a thesis rather than a textbook and is particularly valuable to scientists in the field of vision. The book is well written and packed with information on a widely studied subject.

W.L.B.

INTERPERSONAL RELATIONSHIPS IN THE HOSPITAL. By Warner F. Bowers, M.D., Ph.D., Springfield, Ill., Charles C Thomas, 1960. 125 pp. $5.00.

This book should serve as a useful antidote to the overscientific attitude which some recent medical graduates seem to exhibit. It is full of wise advice and should be required reading for the intern and resident. The practitioner of some experience also might be repaid by a reading of this volume, even though he supposes himself to be well equipped with an urbane and effective bedside manner.

H.L.W.

DIAGNOSIS AND TREATMENT OF DISEASES OF THE TRACHEA AND BRONCHI. By H. J. Moersch, M.D. and H. A. Andersen, M.D., Springfield, Ill. Charles C Thomas, 1960. 108 pp. $4.50.

This book consists of a series of synopses of the signs, symptoms and treatment of nearly, if not quite, all the diseases of the tracheobronchial tree. Although it is not a book which a bronchoscopist would value highly, it would be an excellent source of useful information for the general practitioner. It can be highly recommended to anyone who would like a concise, complete and up-to-date review of the subject in preparation for a board examination.

H.L.W.

WOLFF'S DISEASES OF THE EYE. Edited by R. J. H. Smith. Fifth Edition. Springfield, Ill. Charles C Thomas, 1960, 226 pp. $9.50.

This fifth edition of Wolff's *Diseases of the Eye* is epitomized by a sentence from the review of the fourth edition in the *Oxford Medical School Gazette:* "For the final year student, the general practitioner and the beginner in ophthalmology, there is no better introduction to the subject."

The fourth edition has been considerably revised to bring the fifth edition in line with current thought and practice. It can be strongly recommended as meeting the purpose for which it was designed.

The book has a useful index.

H.L.W.

READING DISABILITY: A MEDICAL STUDY OF WORD BLINDNESS AND RELATED HANDICAPS. By Knud Hermann, Springfield, Ill. Charles C Thomas, 1960. 183 pp. $5.50.

When the number of articles in the lay press of recent years on reading difficulties in children and adults is considered, the importance of this volume is immediately realized, especially by the otologist and oculist, both of whom are expected to furnish information as to whether the reading disability is the result of a somatic disorder. The only two physical disabilities considered by leaders in education to have a relationship to dyslexia have been hearing loss and lack of visual acuity. Such leaders have rejected the suggestion that developmental failure in the cerebral associations having to do with reading and spelling could be the basis of the trouble.

Wendell Johnson, for instance, whose writings on the genesis of speech disorders have been particularly firm in this respect, bases his position on the fact that the same reversal tendencies and the like are found in all beginning readers.

He and most other authorities in education for this reason have been inclined to blame reading disability on generally deficient intellectual power, or poor teaching methods or psychogenic inhibitions of various sorts.

Dr. Hermann, by using the medical, scientific and in particular the neurologic approach, has been able to demonstrate rather convincingly that the word-blind person's difficulty is of a special character which justifies the hypothesis that a specific disorder is at hand. He finds that the symptoms of constitutional dyslexia and Gerstmann's syndrome, which involves a peculiar disturbance of body image and is produced by disease of a circumscribed area in the parietal lobe, have so many features in common that it is very likely that the fundamental disturbance in these two conditions is identical. This is a defect in directional function. This difficulty in orientation has particular consequences for the victim's ability to operate with symbols such as letters, numbers and musical notes.

This discovery places the correction of reading on a factual and rational basis, and offers some hope of correction of this most psychically disabling of all disabilities.

Hermann wrote, "It would undeniably be a social advance if research into word-blindness would convince teachers, mastersmiths and prigs that defective spelling ability is not a sign of stupidity, laziness or lack of culture and that there is no more reason to look down on a butcher who writes 'professor' with two f's and one s, than to look down on a member of parliament who cannot sing an ordinary C sharp scale."

This book should be a must for all physicians who are concerned with classroom difficulties, for all parents with children with scholastic difficulties, and for all teachers, particularly those in primary grades.

H.L.W.

NEWS AND ANNOUNCEMENTS

PAN AMERICAN ASSOCIATION OF OPHTHALMOLOGY HOLDS SIXTH OFFICIAL CONGRESS

Dr. Jorge Valdeavellano, Lima, Peru, was elected president of the Pan American Association of Ophthalmology at the Sixth Quadrennial Congress which was held in Caracas, Venezuela, January 31 to February 6, 1960. Dr. Valdeavellano succeeds Dr. Brittain F. Payne of New York.

Vice presidents elected are Dr. Mark R. Marshall, Edmonton, Alberta, Canada; Dr. Alfonso Gaitan Nieto, Bogota, Colombia; and Dr. Julio Raffo, Lima, Peru.

Dr. Benjamin Boyd, Panama, R. P., was elected executive-director of the Association to succeed the late Dr. Moacyr E. Alvaro, and Dr. Renato de Toledo, Sao Paulo, was elected executive-secretary for countries south of Panama.

Lima, Peru, was chosen as the place for the next Interim Congress in 1962, and Montreal, Canada, for the next official Congress in 1964.

The Gradle Medal was awarded to Dr. Brittain F. Payne at the opening session of the Congress in recognition of his outstanding excellence in graduate and postgraduate teaching.

The Association's medal was awarded to Dr. Conrad Berens of New York for his noteworthy contributions to the prevention of blindness in the Western Hemisphere. This presentation was made at the closing ceremony of the Congress.

More than 600 ophthalmologists attended the Congress; approximately 350 were from the United States.

The inaugural session, held on Sunday morning, January 31, in the beautiful auditorium of the Central University of Venezuela, was a brilliant occasion, with welcoming addresses by Dr. Arnaldo Gabaldon, Minister of Health and Welfare, representing the President of Venezuela, and by Dr. Jesus Rhode, president of the organizing committee of the Congress. Responses were given by Dr. Werther Duque Estrada, Rio de Janeiro, and by Dr. Payne.

In his presidential address, Dr. Payne recalled that the Pan American Association had grown from a membership of about 100 at its initial meeting in 1940 to some 2,000 members at present, representing the Western Hemisphere from Iceland to Tierra del Fuego.

"The Pan American Association of Ophthalmology has been able to serve as an important medium for the exchange of the latest medical and scientific information within the Americas and throughout the world," Dr. Payne said. "The splendid cooperation of ophthalmological societies in all countries has made this program extremely successful. Ophthalmologists from North America have been privileged to visit and learn new methods and procedures from their South American colleagues. Distinguished confreres from South America have lectured and compared notes with ophthalmologists in North America, for the benefit of all of the people of the Western Hemisphere. Perhaps the greatest contribution bestowed on ophthalmology came from South America in the form of cocaine. This wonderful drug made the operation for cataract painless and opened the doors for the advanced surgery we have today. Numerous other contributions such as snake venom and curare, have their origin in South America. Whatever advances have been made in the development of our science in North America, it must be remembered that most of them were anticipated and originated in South America.

"The campaign against blinding diseases has been one of the important objectives of the Association. Our society has worked in close cooperation with the various associations for the prevention of blindness throughout the world. Every country in the Western Hemisphere has initiated programs to prevent blindness and members of our association are identified prominently in the various

organizations. We intend to continue our work in this field."

Dr. Santiago Barrenechea, Santiago, Chile, delivered a eulogy in memory of the late Dr. Moacyr E. Alvaro, Sao Paulo, Brazil, a founder and former president of the Association, who died July 19, 1959. The Gradle Lecture, honoring the memory of Dr. Harry S. Gradle, Chicago, a founder and the first president, was given by Dr. Ivo Correa Meyer of Porto Alegre, Brazil.

Following the formal opening of the Congress, officials of the Association laid a wreath on the tomb of the great South American Liberator, Simon Bolivar, in the national shrine, the Panteon, in Caracas. Afterward the Governor of the Federal District, Dr. Francisco Carrillo Batalla, was host at a luncheon at the Hotel Humboldt, at the top of Mount Avila overlooking the city.

During the ensuing week, the visiting ophthalmologists and their families were lavishly entertained. One evening they saw a program of Venezuelan dances at Puerto Azul; on another they were guests at a symphony concert in Caracas.

The United States Ambassador to Venezuela, the Honorable Edward J. Sparks and Mrs. Sparks were hosts at a reception at the Embassy in honor of the visitors, and the Venezuelan Minister of Foreign Affairs, Dr. Ignacio Luis Arcaya, entertained with a cocktail party at the Casa Amarilla. Dr. Rhode and Senora Rhode also gave a cocktail party at Puerto Azul, and the Venezuelan Society of Ophthalmology sponsored a banquet at Club Puerto Azul.

Tragedy clouded the end of the Congress with the sudden death of Dr. Jose Manuel Espino on February 5. He was 73 years old.

Dr. Espino was dean of Venezuelan ophthalmologists and honorary president of the organizing committee of the Congress. As a member of the organizing committee, he worked strenuously to help make the Congress a success and devoted his full time to it during the actual meeting.

Considered the founder of Venezuelan ophthalmology, Dr. Espino was professor emeritus of ophthalmology of the Central University. He was also a founder of the Venezuelan Society of Ophthalmology and held the title of honorary president. At the time of his death, he was president of the National Academy of Medicine. He was the author of many scientific works, and wrote a History of Ophthalmology in Venezuela, which was issued at the time of a Congress of Medical Sciences in Caracas in 1955. Dr. Espino was active in altruistic endeavors, and only a year ago had donated a residence in a Caracas suburb, El Paraiso, to be used as a home for the blind.

The University declared three days of official mourning for him, and many tributes were published in Caracas newspapers.

ALBERT C. SNELL MEMORIAL LECTURE

The Fifth Annual Albert C. Snell Memorial Lecture was given on April 14, 1960, by Dr. David G. Cogan, Professor of Ophthalmology and Director of Howe Laboratory, Harvard Medical School. He spoke on "Visual and Paravisual Symptoms of Cerebral Disease." An afternoon clinic was held at the University of Rochester School of Medicine, and Doctor Cogan's lecture followed a dinner in the evening.

AMERICAN SOCIETY OF FACIAL PLASTIC SURGERY

The Annual Meeting of the Society was held on April 6 in New York. It featured a Symposium on Methods of Otoplasty, and a motion picture on Otoplasty was presented.

The following officers were elected for the ensuing year: Dr. Sam H. Sanders, president; Dr. John T. Dickinson, vice president; Dr. Samuel M. Bloom, secretary; Dr. Joseph C. Miceli, treasurer; and Dr. W. Eugene Compere, Jr., chairman of the Western Section.

The Society will meet on July 22 in New York, during the Course in Rhinoplasty given by Dr. Irving B. Goldman and his staff from July 16 to 29. The program will include topics on rhinoplasty from the psychiatric and dermatologic viewpoints; experimental studies on bone grafts and biochemical changes in tissues involved in rhinoplasty.

On October 13, at the Palmer House, Chicago, individual members will present their problems in rhinoplasty to panel consultants. A hospitality suite has been reserved at the Palmer House, where members may bring photographs for discussion and evaluation prior to the meeting.

The Annual Spring Meeting in 1961 will be held from February 11 to 14 at the Roosevelt Hotel in New Orleans.

AMERICAN LARYNGOLOGICAL ASSOCIATION

The Annual Meeting of the American Laryngological Association was held on March 18 and 19, 1960, in Miami Beach, Florida. Eighteen scientific papers were presented.

The De Roaldes Award and Gold Medal were presented to Dr. Dean M. Lierle as a great physician, surgeon, educator and humanitarian, and in recognition of his services to Otolaryngology and to the American Laryngological Association.

The James E. Newcomb Award was presented to Dr. Joel E. Pressman in recognition of his outstanding contributions to otolaryngological research.

The following officers were elected for the year 1960-1961: Dr. Edwin N. Broyles, president; Dr. Lyman G. Richards, secretary; Dr. Francis E. Lejeune, treasurer; and Dr. Francis W. Davison, editor, historian and librarian.

The Association's next annual meeting will be held at the Lake Placid Club, Essex County, New York, on May 21 and 22, 1961.

PAN-PACIFIC SURGICAL ASSOCIATION

The Eighth Congress of the Pan-Pacific Surgical Association will be held in Honolulu, Hawaii, September 27 through October 5, 1960. The sections on ophthalmology and otolaryngology will convene every weekday of the Congress. Leading ophthalmologists and otolaryngologists from the United States and the Pacific countries will participate in the program.

Ophthalmologists and otolaryngologists who are interested in attending the Congress are urged to make arrangements as soon as possible to be assured of adequate facilities. Further information and brochures may be obtained by writing F. J. Pinkerton, M.D., Director General, Suite 230, Alexander Young Building, Honolulu 13, Hawaii.

DEVELOPMENTS IN RESEARCH METHODS AND INSTRUMENTATION

The Tenth Annual Instrument Symposium and Research Equipment Exhibit will be held October 4 through 7, 1960, at the National Institutes of Health, Bethesda, Maryland. Primary topics for discussion on the scientific program include (1) fluorescence, (2) infra-red, (3) activation analysis, (4) ultracentrifuge, (5) microscopy, and (6) electrodes. Examples of the latest types of research equipment will be exhibited by instrument manufacturers.

The chairman of the Committee on Symposium on Recent Developments in Research Methods and Instrumentation is Dr. Herman C. Ellinghausen, Agricultural Research Center, U. S. Department of Agriculture, Beltsville, Maryland. Chairman of the Committee on Manufacturers' Representatives is Mr. Louis Heiss, American Instrument Company, Inc., 8030 Georgia Avenue, Silver Spring, Maryland. The exhibit manager will be Mr. James B. Davis, National Institutes of Health, Bethesda, Maryland.

THE AMERICAN OTORHINOLOGIC SOCIETY FOR PLASTIC SURGERY, INC.

The American Otorhinologic Society for Plastic Surgery, Inc., will meet October 9, 1960, at the Conrad Hilton Hotel in Chicago.

European seminars will be held from July 22 to August 20, 1961, as follows: Paris, July 23 to 28; Rome, August 1 to 3; Vienna, August 9 to 11; Geneva, August 13; and London, August 17 to 20.

SECTION ON OPHTHALMOLOGY

AMERICAN MEDICAL ASSOCIATION

PROGRAM

June 14-16, 1960; Eden Roc Hotel, Miami Beach

TUESDAY AFTERNOON, JUNE 14

The Selection of Operative Procedures in Vertical Muscle Imbalances
EDWARD A. DUNLAP, New York

Vertical Recti Transplantation in the A and V Syndromes
JAMES E. MILLER, St. Louis
Panel discussion by PHILIP KNAPP, New York, and CHARLES F. COOPER, JR., Atlanta

Ultrasonography—An Aid in Orbital Tumor Diagnosis
GILBERT BAUM, Bronx
Discussion to be opened by ELMER J. BALLINTINE, Cleveland

Granuloma as a Complication of Polyethylene Tube Buckling Procedure for Retinal Detachment
HARVEY LINCOFF, New York
Discussion to be opened by SILVIO VON PIRQUET, Boston

Precancerous Epithelioma of the Limbus
FRANK C. WINTER and THOMAS R. KLEH, Palo Alto
Discussion to be opened by JOHN S. MCGAVIC, Bryn Mawr

Pathology of Ocular Leprosy: I. Cornea
JAMES H. ALLEN, New Orleans, and JEROME L. BYERS, Dallas
Discussion to be opened by D. P. CHOYCE, London, England

Electroretinography in Pediatric Ophthalmology
GEORGE GOODMAN and HARRIS RIPPS, PH.D., New York
Discussion to be opened by HERMANN M. BURIAN, Iowa City

A Study of Pulseless Disease
JOSEPH L. DOWLING, JR., Providence, and TAYLOR R. SMITH, Boston
Discussion to be opened by VICTOR CURTIN, Miami

WEDNESDAY AFTERNOON, JUNE 15

EXECUTIVE SESSION

Visual Field Changes Following Temporal Lobectomy
JOHN WENDLAND and SIDNEY NERENBERG, Minneapolis
Discussion to be opened by C. WILBUR RUCKER, Rochester, Minn.

Opsoclonus
J. LAWTON SMITH, Baltimore
Discussion to be opened by EDWARD W. D. MORTEN, Miami

Contact Lenses for Aphakics
ROBERT C. WELSH, Miami

Acute Complications from Modern Corneal Contact Lenses: A Report of 14 New Cases
RICHARD K. LANSCHE and ROBERT LEE, Munich
Discussion to be opened by ELIZABETH CONSTANTINE, New York

Recent Experiences with Light Coagulation
HERBERT WIESINGER, WALTER GEERAETS, and DU PONT GUERRY, III, Richmond
Panel discussion by WILLIAM N. HAVENER, Columbus, and TAYLOR R. SMITH, Boston

THURSDAY AFTERNOON, JUNE 16

Recent Advances in Ocular Surgery
Chairman's Address
HAROLD G. SCHEIE, Philadelphia

Address of Guest of Honor:
Enzymatic Zonulolysis in Lens Extraction
JOAQUIN BARRAQUER, Barcelona, Spain
Discussion to be opened by DERRICK T. VAIL, Chicago

Address of Invited Foreign Guest:
Anterior Chamber Lenses: Present Operative Technique
BENEDETTO STRAMPELLI, Rome, Italy

Address of Invited Foreign Guest:
Uses of Anterior Chamber Implants in Ocular Surgery
D. P. CHOYCE, London, England
Panel discussion by JOAQUIN BARRAQUER, Barcelona, Spain, and DU PONT GUERRY, III, Richmond, Virginia

Surgical Treatment of Bullous Keratopathy
TRYGVE GUNDERSEN, Boston
Discussion to be opened by A. EDWARD MAUMENEE, Baltimore

Surgical Treatment of Epithelial Cysts of the Anterior Chamber
ERNEST K. GOODNER, and MICHAEL J. HOGAN, San Francisco
Discussion to be opened by PAUL A. CHANDLER, Boston

A Report on 42 Cases of Glaucoma Treated by Peripheral Iridectomy with Scleral Cautery
GEORGE S. TYNER, DUANE LANEY, JOHN ELLIFF, and HARRY WATTS, Denver
Panel discussion by JOHN M. MCLEAN, New York, and CARTERET LAWRENCE, Baltimore

PACIFIC COAST OTO-OPHTHALMOLOGICAL SOCIETY

The Pacific Coast Oto-Ophthalmological Society will hold its Annual Meeting at the Hotel St. Francis, San Francisco, California, May 22 to 26, 1960. Guest speakers will include Dr. E. S. Perkins, London, England; Dr. A. M. Ostfeld, Chicago; Dr. Edwin J. Wylie, San Francisco; Dr. Bruce N. Kvernland, Portland; Dr. Jerome A. Hilger, St. Paul, Minn.; Dr. Merle Lawrence, Ann Arbor; Dr. John R. Lindsay, Chicago; and Dr. Jack V. D. Hough, Oklahoma City.

Room reservations for the meeting may be obtained by writing Mrs. Lorraine Berry, Housing Bureau, Room 300, 61 Grove St., San Francisco.

NORTH CAROLINA EENT SOCIETY SOUTH CAROLINA SOCIETY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

The Joint Annual Meeting of the North Carolina Eye, Ear, Nose and Throat Society and the South Carolina Society of Ophthalmology and Otolaryngology will be held September 12 to 14, 1960, at the King Cotton Hotel in Greensboro, North Carolina.

Guest speakers for ophthalmology will include Dr. Frank Walsh and Dr. Howard Naquin of Baltimore, and Dr. Joseph Haas of Chicago. Guest speakers for otolaryngology will include Dr. Sam Sanders of Memphis, Dr. Philip Meltzer of

Boston, and Mr. Aron Saunders of Durham.

For further information please write Dr. John Gordon, 412 North Church St., Charlotte 2, North Carolina, or Dr. Roderick Macdonald, 330 East Main St., Rock Hill, South Carolina.

GUEST LECTURER ON EYE DISEASES IN AFRICA

Dr. D. S. McLaren, East African Institute for Medical Research, East Africa High Commission, P. O. Box 162, Mwanza, Tanganyika, East Africa, will be touring the United States September 7 to November 23. He will be available to medical societies on invitation for discussion of the following subjects:

Eye Disease in East Africa. An account of the important eye conditions in this area. These include trachoma, leprosy, onchocerciasis, senile and other forms of cataract, and nutritional conditions such as xerophthalmia and keratomalacia, nutritional amblyopia and malnutritional keratitis.

Nutritional Eye Disease. In this talk the effects of malnutrition upon the eye are discussed, based upon personal clinical experience in India, Indonesia, Ethiopia and East Africa, and several years of experimental research at the National Institute for Medical Research in London.

The Ocular Complications of Leprosy. The eyes of many hundreds of lepers in Tanganyika have been examined, and the role of leprosy itself, malnutrition, and other eye diseases in the production of the lesions observed is discussed.

The Refraction of Two Bantu Tribes in East Africa. Very little is known about the refractive state of populations on the continent of Africa. New and interesting results are presented, based upon the refraction of more than 1500 African children.

Ocular Onchocerciasis in East Africa. This talk consists of a review of the present knowledge of the relationship between onchocercal infestation and eye lesions. (Original illustrations will be included if a study due to be undertaken in early 1960 goes through.)

INSTRUCTION COURSES

Ohio State University

A course in practical perimetry for office assistants will be presented at the Ohio State University by the Department of Ophthalmology from July 18 to 20. The course is planned to teach a reliable and intelligent assistant to perform routine perimetry. Registration is limited to individuals sponsored by a medical doctor. Registrations received after July 1 will be accepted only if space remains available. Applications will be validated by receipt of a $25.00 check made payable to the Department of Ophthalmology, Ohio State University. Full refund will be made if the applicant is unable to attend the course.

On July 21 and 22, a course for ophthalmology secretaries will be presented at the Ohio Union, 13th and High Streets. It is designed to be understandable to the intelligent secretary with no previous eye experience. This course is planned to familiarize your secretary with terminology and basic facts. We hope to teach the measuring of visual acuity and the neutralizing of lenses with the lensometer. Receipt of a $20.00 check made payable to the Department of Ophthalmology, Ohio State University will validate the applications. Only individuals sponsored by a medical doctor are eligible. Registrations received after July 1 will be accepted only if space remains available. Full refund will be made if the registrant is unable to attend.

Further information on the above courses may be obtained by writing William H. Havener, M.D., Ohio State University, Columbus 12, Ohio.

POSTGRADUATE COURSES

Institute on Occupational Hearing Loss

The eighth consecutive Institute on Occupational Hearing Loss will be held from August 8 to 13, 1960, at Colby College in Waterville, Maine.

The course is designed to train physicians, plant nurses, plant engineers, and others in initiating and conducting hearing conservation programs in noisy in-

dustries. The course is comprehensive and includes all phases of the problem. Dr. Frederick T. Hill and Dr. Joseph Sataloff are directors of the program. The fee of $200 includes tuition, board and room. Requests for further information should be made to William A. Macomber, Colby College, Waterville, Maine.

Institute of Ophthalmology of the Americas

The Institute of Ophthalmology of the Americas announces that its Third Series of Post-Graduate Courses for Specialists in Ophthalmology will be given from September 12 through November 23, 1960.

Among the courses to be offered are Advances in Ocular Prostheses; Anomalies of Extraocular Muscles, including Ptosis; Biomicroscopy; Biomicroscopy Using Near Ultra-Violet, Cobalt Blue and Polarized Light; Clinical Bacteriology; Clinical Problems of Tear Formation; Complications of Ophthalmologic Surgery; Contact Lenses; Electrophysiology and Applied Physiology of the Eye; Enucleation and Evisceration; Glaucoma; Gonioscopy and Tonography; Keratectomies and Keratoplasties; Lacrimal Sac Surgery; Light Coagulation (Meyer-Schwickerath Apparatus); Low Vision Aids; Ocular Biochemistry; Ocular Geriatrics; Ocular Microbiology; Ocular Neuro-Ophthalmology; Ocular Photography; Ocular Radiology; Ocular Therapeutics; Ophthalmoscopy; Orthoptics; Pathology; Perimetry; Physiological Optics; Plastic Eye Surgery; Pleoptics and Macular Function Testing; Psychosomatic Factors in Ophthalmology; Radio-Isotopes in Ophthalmology; Recent Advances in Cataract Surgery; Refraction; Retinal Detachment; Surgery of the Orbit; and Uveitis.

Catalogs and additional information may be obtained by writing to Mrs. Tamar Weber, Registrar, Institute of Ophthalmology of the Americas, New York Eye and Ear Infirmary, 218 Second Avenue, New York 3, N. Y.

Colorado

The Colorado Ophthalmological Society and the Division of Ophthalmology of the Department of Surgery and the Office of Postgraduate Medical Education of the University of Colorado School of Medicine are co-sponsoring a postgraduate course in ophthalmology to be held in conjunction with the summer convention of the Colorado Ophthalmological Society in Aspen, Colorado, July 5 to 8, 1960.

Guest speakers will include Dr. F. Bruce Fralick, Ann Arbor; Dr. Michael J. Hogan, San Francisco; Dr. Albert N. Lemoine, Jr., Kansas City; and Dr. Albert D. Ruedemann, Detroit.

For further information write Office of Postgraduate Medical Education, University of Colorado Medical Center, 4200 East Ninth Ave., Denver 20, Colorado.

THE NATIONAL SOCIETY FOR CRIPPLED CHILDREN AND ADULTS

A research project to develop ultrasonic neurosurgical techniques for alleviating uncontrolled muscle movements in persons with cerebral palsy has received an additional $15,000 grant from the Easter Seal Research Foundation. The grant to the State University of Iowa supports the study conducted by Russell Meyers, M.D., in collaboration with William J. Fry, head of the Biophysical Research Laboratories, University of Illinois. Dr. Meyers is chairman of the Division of Neurosurgery at the State University of Iowa Hospitals.

William T. Sanger, Ph.D., chairman of the Foundation's board of trustees, announced the award.

The project has been under way for more than a year through an earlier $15,000 Easter Seal Research Foundation award. Using an ultrasonic device developed at the University of Illinois, Dr. Meyers is attempting to learn the function of each microscopic segment of the thalamus. The researchers hope to be able to tell precisely what area of the thalamus is responsible for controlling certain functions of the body. They hope to apply the knowledge in aiding persons crippled by conditions such as cerebral palsy.

NEW YORK UNIVERSITY

The appointment of Dr. George N. Wise as professor of ophthalmology at the New York University Medical Center has been announced by Dr. S. Bernard Wortis, dean.

Dr. Wise is a graduate of the University of Virginia School of Medicine and holds the degree of Doctor of Medical Science from Columbia University. He is an associate attending in ophthalmology at New York University Hospital. Dr. Wise has been active in postgraduate teaching at the New York University-Bellevue Medical Center for the past ten years and has contributed numerous publications in the field of retinovascular disease.

Dr. Wise is a diplomate of the American Board of Ophthalmology. He is secretary of the Section on Ophthalmology of the New York Academy of Medicine and is a member of the Association for Research in Ophthalmology, the New York Diabetes Association, American Ophthalmological Society, the Pan American Association of Ophthalmology, the New York State Society of Medical Research, the Societe Francaise d'Ophtalmologie, and a number of other scientific and professional societies.

INTERNATIONAL MEDICAL ADVISORY BUREAU

The Council of the British Medical Association has established an International Medical Advisory Bureau at British Medical Association House, Tavistock Square, London, W. C. 1.

One of the main objects of the Bureau is to welcome the overseas medical visitor. He is cordially invited to visit the Bureau as soon as possible after arrival and discuss with the Medical Director any points on which he may need advice or assistance.

Information is available at the Bureau on postgraduate education facilities, and visits to hospitals and clinics can be arranged. Assistance will be given in finding suitable hotel and lodging accommodations. In addition, general information on cars, sports, traveling, exhibitions, and theaters is available.

Advance information as to the expected date of arrival, mode of travel, length of stay, main objects of visit and special needs for assistance will enable the Bureau to provide the best service. Those wishing to visit hospitals or seeking advice about postgraduate courses should provide the Bureau with information as to professional experience.

All communications should be sent to The Medical Director, International Medical Advisory Bureau, Tavistock Square, London, W. C. 1, England.

LESLIE DANA MEDAL

The selection of Derrick Vail, M.D., for the 1959 Award of the Leslie Dana Medal was announced by the executive committee of the National Society for the Prevention of Blindness.

Among other professional activities, Dr. Vail for many years has been editor-in-chief of the American Journal of Ophthalmology. The National Society will cooperate with the St. Louis Society in making arrangements for the presentation.

LETTER TO THE EDITOR

Mr. William T. Heimlich announced on March 15 that the American Board of Contact Lens Certification was deactivated on December 12, 1959. The Guild of Prescription Opticians of America, Inc., has ceased all efforts toward the certification of contact lens technicians.

RESEARCH TO PREVENT BLINDNESS, INC.

Formation of a new national organization to stimulate and finance increased basic research into the causes that blind over 40,000 persons yearly in the United

States, was announced April 18 by Mr. Jules C. Stein, Chairman of the Board of the Music Corporation of America and a former practicing ophthalmologist.

The new organization is a New York State membership corporation, called "Research to Prevent Blindness, Inc." with offices at 598 Madison Avenue, New York.

Associated with Mr. Stein are the following health leaders: Mrs. Albert D. Lasker, president of the Albert and Mary Lasker Foundation, New York; Mr. James S. Adams, general partner of the investment banking firm of Lazard Freres and for many years Chairman of the Executive Comittee and of the Research Committee of the American Cancer Society; Mr. Robert E. McCormick, a corporate vice president of Olin-Mathieson Chemical Corporation and Trustee for the American Foundation for the Blind and for the Eye Bank. Mr. Mefford R. Runyon, for ten years executive vice president of the American Cancer Society, is executive director. Dr. C. J. Van Slyke, recently retired as deputy director of the National Institutes of Health of the United States Public Health Service, is scientific director. Mr. William J. vanden Heuvel, presently associated with the law firm of Javits, Moore and Trubin, is secretary and counsel.

Mr. Stein stated that the objectives of the new organization are to foster and underwrite increased research into the causes which may result in blindness or in substantially impaired vision so that they may be prevented or cured **before** blindness occurs.

"Many existing organzations are concerned with alleviating the plight of the person after he becomes blind. They are doing most essential humanitarian work and should be encouraged in every way. However, it is the feeling of our group," said Mr. Stein, "that basic research into the causes that blind over 40,000 persons annually in the United States should be vigorously stimulated and financed.

"Statistically 350,000 persons in this country are blind; 1,500,000 are blind in one eye; 40 per cent of our population has some eye defect; 9,000,000 children require some form of eye care; 40,000 are born blind or go blind each year.

"Over $150,000,000 is spent each year by private and public agencies to provide necessary care for those already blind, in addition to the millions lost annually by their lessened economic output. Yet less than $4,000,000 is provided annually by both private and government agencies in support of research to prevent blindness.

"Despite the inadequate funds which have been available for research," Mr. Stein said, "we can view with pride the dramatic and spectacular accomplishments of our competent and dedicated ophthalmologists during the last ten years."

As an indication of how research pays off, he cited advances in the prevention of retrolental fibroplasia, in the early discovery and medical treatment of glaucoma, and in the surgical removal of cataracts.

"In spite of these and other advances," Mr. Stein asserted, "many thousands of our citizens lose their sight each year. Therefore we should think of the accomplishments of the last ten years as evidence of the potential of research—research which can improve the outlook for millions who now have serious eye disorders, and for other millions who will eventually be blinded unless we find the answers in time through an expanded research program."

Research to Prevent Blindness, Inc. will cooperate fully with all existing voluntary agencies in any effort to prevent or alleviate blindness and with the United States Public Health Service's National Institute of Neurological Diseases and Blindness which has for some years been making grants of federal funds for the training of research workers, and for their laboratory and clinical research programs.

Mr. Stein revealed that a symposium was held in New York City on March 20th under the new organization's auspices. The following leading ophthalmologists from all parts of the United States participated:

Dr. A. E. Balazs
Retina Associates
Boston, Massachusetts

Dr. Bernard Becker
Chairman, Department of Ophthalmology
Washington University School of Medicine
St. Louis, Missouri

Dr. Conrad Berens
Managing Director
The Ophthalmologic Foundation, Inc.
New York, New York

Dr. Goodwin M. Breinin
Chairman, Department of Ophthalmology
N. Y. U. College of Medicine
New York, New York

Dr. Ramon Castroviejo
Professor, N. Y. U.
New York, New York

Dr. David Cogan
Harvard University School of Medicine
Boston, Massachusetts

Dr. John E. Harris, Chairman
Department of Ophthalmology
University of Minnesota Medical School
Minneapolis, Minnesota

Dr. Michael J. Hogan, Director
Francis I. Proctor Foundation
University of California Medical School
San Francisco, California

Dr. V. Everett Kinsey
Kresge Eye Institute
Detroit, Michigan

Dr. Irving Leopold
Chairman, Department of Ophthalmology
Graduate School of Medicine
University of Pennsylvania
Philadelphia, Pennsylvania

Dr. John McLean
Chairman, Department of Ophthalmology
Cornell University Medical School
New York, New York

Dr. A. E. Maumenee
Director, Wilmer Ophthalmological Institute
Johns Hopkins Hospital, JHU
Baltimore, Maryland

Dr. Frank Newell
Chairman, Section of Ophthalmology
University of Chicago School of Medicine
Chicago, Illinois

Dr. Edward Norton
Chairman, Department of Ophthalmology
University of Miami School of Medicine
Coral Gables, Florida

Dr. Charles L. Schepens
Retina Associates
Boston, Massachusetts

Dr. Bradley Straatsma
Chief, Division of Ophthalmology
University of California
San Francisco, California

Dr. Phillips Thygeson
Francis I. Proctor Foundation for Research in Ophthalmology
University of California Medical Center
San Francisco, California

Dr. Fred M. Wilson
Chairman, Department of Ophthalmology
Indiana University School of Medicine
Indianapolis, Indiana

The symposium was also attended by the chief executives in the National Institute of Neurological Diseases and Blindness of the U. S. Public Health Service, and officers of the National Council to Combat Blindness, Inc., The Ophthalmological Foundation, Inc., and the National Society for the Prevention of Blindness, Inc.

The meeting, Mr. Stein said, "provided a forum in which these scientists and physicians on whose efforts we must depend for progress in this whole field could fully and frankly discuss the present status of research in the field of ophthalmology. Thus it served to guide and advise R.P.B. as to the opportunities, needs and present roadblocks to an expanded national research effort in this field, in terms of the needs for scientific manpower, laboratory facilities and financial support."

Mr. Stein and Mr. McCormick, Dr. Maumenee and Dr. Newell appeared under the organization's sponsorship before Chairman John Fogarty and the House Appropriations Subcommittee in Washington, D. C. on March 1. They presented expert testimony in support of increased federal appropriations for research in the field of blindness. They will give similar testimony to Chairman Lister Hill and the Senate Appropriations Subcommittee within the next few weeks.

"The organization is providing this testimony," Mr. Stein emphasized, "because of the need for more federal funds for research and also because it wishes

to integrate at all times its own activities with those of government and of the other voluntary agencies.

"Although Research to Prevent Blindness, Inc. presently plans no general solicitation of the public, it will in the future seek financial support from interested individuals, foundations, corporations and others through tax deductible contributions," Mr. Stein said. "Our new organization is firmly convinced that adequate research will reduce the incidence of blindness, conserve the economic output of blinded persons, and eliminate the dependence, misery, and loneliness which only those deprived of the blessing of sight can really understand."

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